

VOLUME
VII
FEB.
1898
No. 2

THE BRICKBUILDER

OFFICE
85
WATER
STREET
BOSTON

THE BRICKBUILDER.

AN ILLUSTRATED MONTHLY DEVOTED TO THE ADVANCE-
MENT OF ARCHITECTURE IN MATERIALS OF CLAY.

PUBLISHED BY

ROGERS & MANSON,

CUSHING BUILDING, 85 WATER STREET, BOSTON.

P. O. BOX 3282.

Subscription price, mailed flat to subscribers in the United States and Canada		\$2.50 per year
Single numbers		25 cents
To countries in the Postal Union		\$3.50 per year

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Entered at the Boston, Mass., Post Office as Second Class Mail Matter,
March 12, 1892.

THE BRICKBUILDER is for sale by all Newsdealers in the United States and Canada. Trade Supplied by the American News Co. and its branches

PUBLISHERS' STATEMENT.

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THE BRICKBUILDER is published the 20th of each month.

SMALL OPPORTUNITIES.

A CRITICISM, which is often quoted against the species of architectural training which is afforded by the Ecole des Beaux Arts in Paris, is that the problems treated therein are not practical ones; that the large, monumental style of design which finds favor with the school traditions is not of the sort by which we Americans can most truly profit, and that a young man who follows such a course of training views architecture through the wrong end of the opera glass. Such a criticism springs from a misconception of architecture as a fine art. The difference in the results of American and foreign architecture, and the causes of much of the deficiencies which we cannot but admit and regret in our national civic architecture are due very largely to the bias which we seem to have inherited from our English artistic parentage, of viewing architecture as a development from the individual house to the palace, rather than considering it to be the art of the palace which may be applied to the small house. In other words, architecture, when at its best, is a development of wealth and power; and if we have artistic homes, if our small buildings are successful in an artistic sense, it is because of the opportunities which wealth and power have placed within the reach of the profession, whereby opportunities for study in the large have been afforded. It is only in proportion as we disregard expense, *per se*, disregard the so-called practical conditions, that we are able to produce work which will stand in the artistic sense. We would not be understood by this as saying that practical conditions should not be considered at all; but viewing architecture as a fine art, which it undoubtedly can be and is in the hands of our best practitioners, the practical elements should be considered only in as far as they are

essential to a proper artistic treatment of the whole, for, however practicable a building may be, if it is not artistic it is not architecture.

Now, every one does not have the opportunity to build palaces, in this country especially, and most of us have to content ourselves with what crumbs of artistic possibilities may fall to our table. Such a limitation need not imply, however, a lack of appreciation of possibilities for the larger development, if we will bear in mind that art is more than steel construction or foundations, and when we are obliged to delve in the humbler lines of design, will keep our minds ready and trained for the study of the larger solutions. We believe that growth is well-nigh impossible for an architect whose practise is limited to ordinary buildings, if he confines his attention simply to the structures which come to his hand. He must reach out beyond, and undertake in moments of leisure study to grapple with the great problems, to test his strength on the broader type, otherwise even his small buildings will deteriorate in quality, and he will find it hard to keep what power he has. No one can afford to know it all nowadays; we must keep studying, keep reaching out, searching for the larger opportunities. A story is told of an architect in Belgium who for twenty years, without any encouragement, spent all his spare time in seriously studying the plans and possible designs for a monumental structure; and when after years of study he was elected, a man almost unknown, to design the new law courts in Brussels, he was able to bring out his previous studies and show how for twenty years he had been elaborating the very scheme. The result of his continued thought shows in the building, which is unique in many ways, and ranks among the best of its kind. Now, that is what we need to do if we would not let our weapons get rusty. The throttling effects of limited opportunities is a factor which every architect appreciates who has the artistic success of his profession at heart, and it is a matter of necessity in these days, when the manifestations of art are spreading so fast, and its possibilities are so much enlarged, that we should be ready when the time comes to meet the higher demand.

But even if it never comes, even if one all his life is to be bound down to the petty, small problems, the spirit which will prompt him to study the large opportunities will manifest itself in the small ones, and his work will be so much the better for it. Architecture is pre-eminently the art which depends upon size for its effect, and yet the large feeling which is manifest in such works as the Temple of Karnac or the south front of the Louvre finds its expression sometimes in even so simple a thing as a library interior in a five thousand dollar house or the treatment of a brick gable. Limited opportunities belittle if treated in a petty spirit, but when viewed with a larger scope, when the opera glass is turned the other way and we approach our architecture from the monumental side, the small opportunities can be magnified into great successes.

WE resume in this number the republication of Street's "Brick and Marble Architecture in Italy," which was interrupted two years ago on account of the pressure of other matter; and we are sure our readers will be glad that the completion of our republication can now be continued without further interruption. The book is of value not only because it still remains, perhaps, the best account in English of the architecture of which it treats, but it has the farther interest, in the insight it gives into the point of view of one of

the foremost of the architects who led the Gothic revival in England in the middle of the century. Traveling in Italy was in those days by no means so common, even among architects, as it has since become, and these notes of journeyings in Italy have an added zest if one reads them remembering that they were written as an account of explorations in comparatively unknown regions; for the architecture of which it treats had hitherto been overlooked by most, even, of those who traveled in Italy.

We shall, as before, illustrate the subjects in each successive instalment of the republication, by reproductions from photographs. This will give us the opportunity of offering to our readers a large amount of material from the best of Italy's brick and marble architecture. We shall illustrate especially the brickwork on the buildings in which brick and marble is combined; but occasionally, as in the present number, which treats of St. Mark's at Venice, our text will lead us to show subjects in which brickwork does not appear, though at St. Mark's the structure is of brick, and, indeed, originally the brickwork was displayed, and was not encased with marble as it came to be soon after its construction.

THE American Architect and Building News Company has published a work of considerable interest in the shape of a series of plates illustrating the Georgian or colonial period of American architecture, reproduced from drawings by many of our best-known illustrators, including such names as Gregg, Wallis, Bragdon, and many others. The first part includes thirty-three well-selected plates, the subjects of which, while not altogether unfamiliar to the architectural public, are such as to make the collection of very tangible value. Part II., which is now in course of preparation, is to contain not less than forty-eight plates of measured drawings, many of which have never before been published, together with a number of gelatine prints of details from domestic and public buildings in the New England, Middle, and Southern States. The work is issued at prices of \$4.00 and \$6.00 for the respective parts. It forms a welcome addition to the available illustrative publications upon the subject.

The Georgian Period: being measured drawings of colonial work in the United States. Boston: American Architect and Building News Company.

PERSONAL AND CLUB NEWS.

GEORGE H. INGRAHAM, architect, Boston, has taken offices in the Tremont Building.

H. C. RUTHERFORD, architect, Scranton, Pa., has removed his offices to the Burr Building. Samples and catalogues desired.

HENRY LOOMIS CURTIS has opened an office for the practise of architecture at 1120 Harrison Building, Philadelphia.

WESTLAKE & HOWARD have opened an office for the practise of architecture in the Johnson Building, Muncie, Ind. Samples and catalogues desired.

MR. GEORGE W. GOVINLOCK, architect, has removed his offices from 53 King Street, East, to the seventh floor, Temple Building, corner of Bay and Richmond Streets, Toronto.

LONG & KEES, architects, Minneapolis, Minn., have dissolved partnership. Mr. F. B. Long has formed a copartnership with his son, Louis L. Long, under the firm name of F. B. Long & L. L. Long, with offices in the Kasota Building.

SHANK & WETHERELL, architects, Observatory Building, Peoria, Ill., have dissolved partnership, Mr. Shank retaining the old office, and Mr. Wetherell associating himself with Richardson & Hotchkiss, Dime Savings Bank Building, under the firm name of Richardson, Wetherell & Hotchkiss.

MR. CHARLES S. FROST, formerly at 604 Pullman Building, Chicago, and Mr. Alfred H. Granger, of Cleveland, Ohio, have formed a partnership under the firm name of Frost & Granger, architects, and after Feb. 1, 1898, will be located at 806 The Temple, southwest corner of La Salle and Monroe Streets, Chicago.

A REGULAR meeting of the T Square Club was held on Wednesday evening, January 19, the subject for competition being, "A Club House for a Country Club."

Mr. Walter Cope led the criticism on the ten designs submitted.

First mention was awarded to Mr. A. M. Githens; second mention, to Mr. W. P. Trout; and third mention, to Mr. George G. Bassett.

CHICAGO ARCHITECTURAL CLUB happenings of recent date are as follows:—

Mr. P. B. Wight, secretary of the Illinois Board of Examiners for Architects, delivered a lecture at the club rooms, Monday evening, January 24, on the new law governing the practise of architecture in the State of Illinois, and its benefits.

On Monday evening, February 7, the members of the club were requested to come to the club rooms prepared with pencils, sketch blocks, and bright ideas, to participate in a competition for the design of a building, the governing conditions of which were announced on that evening.

A time limit of one half hour was set for the preparation of sketches, and a general criticism and discussion of the problem followed.

The second and third exhibitions of Projet Drawings took place on the evenings of January 31 and February 14 respectively. Different squads of members dispensed the hospitality of the club on each occasion.

ILLUSTRATED ADVERTISEMENTS.

ON page vii, in the advertisement of Fiske, Homes & Co., number eight of the series of brick and terra-cotta fireplace mantels is shown.

A new residence at Pittsburgh, Pa., is illustrated in the advertisement of Harbison & Walker Company, on page xiii.

Number four of the descriptive series of the roofing tiles made



TYMPANUM IN CENTRAL DORMER OF A SIXTEEN-STORY HOTEL
ON 33D STREET, NEW YORK.

H. J. Hardenbergh, Architect.

Executed by the New York Architectural Terra-Cotta Company.

by the Celadon Terra-Cotta Company, Charles T. Harris, lessee, is given in the company's advertisement, page xxvii.

Examples of bond, showing blocks of the Gilbreth Seam-Face Granite laid up in two styles of bond, is illustrated in the company's advertisement, page xxxiv.

THE LEAGUE EXHIBITION.

THE Annual Exhibition of the Architectural League of New York has come to be one of the artistic features of the year, both on account of the manner in which it has been managed and for what it represents. It is true that the public, properly so styled, gives the exhibition but scanty support, and even the profession in New York does not put itself in evidence either by attendance or by a specially manifested interest, but that it has a very positive influence and a recognized value can hardly be questioned by any one who has had the good fortune to attend during successive years. In the present exhibition there are fewer small subjects than last year, less merely pretty architectural picture making, but there seems to be a more evident sympathy for monumental architecture, and more and better attempts than in any previous year to large and broad treatment.

A very fascinating set of drawings, and in some respects one of the most interesting in the exhibition, is that exhibited by Cope & Stewardson, showing the building for the Pennsylvania Institution for the Blind, a structure recalling the North Italian work, with a touch of the Southern Californian Mission style, with red tile roofs, and walls presumably stuccoed, forming a bright, sunny combination, with excellent proportion and a few carefully studied details, a most pleasing group, and one which would indicate a unique and very successful building. The drawings themselves were extremely clever of their kind.

Another most excellent example of brickwork is shown by the design for the new Court House of Livingston County, at Geneseo, N. Y. The building itself is shown as a colonial combination of Flemish bonded brick, with stone quoins, and a center treatment consisting of a high two-storied colonnade with pediment presumably of wood, a design which, handled with less nicety of proportion and sense of fitness, might easily become commonplace, but which is a charming bit of composition, and is ably presented by the drawing. The perspective is in black and white, and shows the building set in a winter landscape, with a few hunters on horseback in the foreground, the coats of hunters a bright scarlet, as if at the last moment Mr. Bragdon, after having made the whole drawing in pen and ink, had felt the need of a sharp note in the foreground. What makes the drawing all the more interesting is that instead of

using hard India ink, the draughtsman has employed a writing ink, just a slight purplish-gray black, which softens the effect wonderfully.

Mr. R. Clipston Sturgis contributes a sketch for a country house, of brick and stone in a semi-Tudor style, with simple quiet treatment of lawn and terraces in front. This house we hope to illustrate in a later issue. Another very pleasing sketch is contributed by Mr. Frank Allison Hays, showing an arrangement of brick gable end with a picturesque group of chimneys, forming addition to an existing house.

Cope & Stewardson also exhibit a design for house for J. S. Morgan, at Princeton, an example of the kind of work the clever Philadelphians have been doing of late in combinations of brick and stone. Charles I. Berg has an interesting drawing, a block of five city houses treated like one continuous eighteenth century palace, with marked end pavilions and Mansard roof, the face being carried out in red brick and white stone. The whole arrangement of the basement, the high principal story, and the grouping of the roofs is quite in the style of the French work.

Mr. E. P. Casey has a drawing for one of the city engine houses, presumably on an isolated plot, a design in red brick and white stone trimmings in the French style, which at present seems to be quite the fashion in New York. Tracy & Magonigle contribute several of Mr. Magonigle's very strong, simply treated water-color sketch designs, especially one for an inn at Bernardsville, N. J., a combination of half timbering, plaster gable work, a green roof, and a long, low-lying ell running off towards the stable, with a blank brick wall tied into the first story brick-

work of the main structure; a remarkably brilliant drawing.

The drawing of a house at Bar Harbor, by John Calvin Stevens, is a surprise. It represents a brick-gabled, quiet Tudor style of house, with projecting wings, a pedimented entrance, a broad terrace with balustrades across the front, with a line of high brick wall tying the house and stable together; a very comfortable composition, but so different from Mr. Stevens's usual highly picturesque treatment that we looked twice at the catalogue to make sure it was his. If this is a new manner with Mr. Stevens, he is surely to be congratulated.

A drawing which looks as if it were a page taken from some quiet, sleepy town of Holland is a design for the Wallabout Market Tower, Brooklyn, by W. B. Tubby, architect. The perspective



drawing is signed by Robert L. Adams. It shows a queer, quaint combination of gables, long, narrow slitted windows, a huge clock dial, and a picturesque chimney climbing up towards the top of a square, solid brick tower, with quite the flavor which is hanging around Haarlem and Delft. We wish there were more such.

A building which has been previously illustrated in this journal is shown at the League Exhibition by a carefully rendered elevation. In the Crozier Building, Philadelphia, Mr. Frank Miles Day has been able to accomplish what is so often attempted—a design of a tall commercial building which is architectural from grade line to pinnacle, with a well-defined base, a simple shaft, and elaboration into a crowning capital. Whether all commercial considerations will tolerate in other instances a high-pitched roof is a question which does not affect the artistic qualities of this design. It is to be doubted, also, whether many property owners would be willing to sacrifice so much space in the ground story in the shape of heavy piers and arches to afford an adequate and proportional support for the upper stories; but certainly, taken as a whole, it is one of the most successful designs of its kind which we have seen. If we are rightly informed, it is entirely of brick and terra-cotta above the ground floor.

A lack in the exhibition is the absence of any decorative work in tiles or colored terra-cottas. We know there is plenty of this being done, and of a very high artistic quality, but somehow it does not seem to find its way into exhibitions. There are a few samples shown of underglaze on tiles, but they are too amateurish to count as serious work.

An exhibition of this sort is an architectural tonic. Not all that is exhibited is good, by any means, and we miss the work of many representative architects, but the value, as a whole, is quite appreciable, even if not precisely defined. Sometimes we feel the best good from such an effort comes beforehand, in the months of preparation, in anticipation, and in the species of mental restraint which the knowledge that we are going to exhibit will exert over one. Not that the drawings have the appearance, however, of being made especially for show, rather each year there is less of this and more indications that the drawings represent the manner in which architects are working out their ideas in architectural practise. One of the speakers at the League dinner made the witty remark that whenever he went to church he was convinced that an architect not only built the edifice, but must have planned that part of the service which declares he had left undone the things he ought to have done. The point would apply to any exhibition; still, the things which are done and done so well, and which are growing in number every year, are abundant testimony to at least the direction of growth which make this exhibition all that it is.

THE T SQUARE CLUB EXHIBITION.

WE have received the very successful illustrated catalogue of the architectural exhibition of the T-Square Club, Philadelphia. It is interesting to compare this number with those of

some of the first years in which the club held its exhibitions and note how marked has been its progress. Indeed, we question whether any other one publication could more fittingly show the change in attitude of the architect than these illustrated catalogues. The club this year has evidently made considerable effort to interest foreign contributors. There are several English drawings, notably R. Norman Shaw's wonderfully clever drawing of the building for the Alliance Assurance Company, London; also some of Ernest George's equally charming interiors. The comparison which this catalogue affords between the work of our foreign brethren and that of some of the trained coterie who have given the T-Square Club its reputation is decidedly interesting and instructive, and while the English work is on slightly different lines, the result is, from our standpoint, by no means to the detriment of our home talent. The catalogue contains an unusual quantity of most excellent material.

THE Managing Committee of the John Stewardson Memorial Scholarship in Architecture announces by authority of the Trustees of the University of Pennsylvania, who act as trustees of the Memorial Fund, a competition for a scholarship of the value of one thousand dollars, the holder of which is to spend one year in travel and in the study of architecture in Europe under the direction of the committee.

Candidates must be under thirty years of age, and must have studied or practised architecture in the State of Pennsylvania for the period of at least one year immediately preceding the first day of March, 1898. Programs of the competition may be had by addressing Mr. Frank Miles Day, Secretary of the Managing Committee, 925 Chestnut Street, Philadelphia.

TESTS OF THE CRUSHING STRENGTH OF BRICK PIERS.

BY PROF. CECIL B. SMITH.

THE following tests of the crushing strength of brick piers are interesting both as regards the absolute loads recorded, and also because, while with lime mortar brickwork the strength of the mortar determines the load which the pier can carry, this is not so where good Portland cement mortar is used. The tests show that the quality of the brick determines the pier strength, as the first and second brands of cement were rather superior to the third and fourth, as is shown by the tests of a cube of mortar from the same mixing; but the superior strength of the pressed brick became evident in spite of this.

Another interesting point always brought out by such tests is that the pier strength per square inch is considerably less than that of a single brick on its flat, but considerably more than cubes of mortar, *i. e.*, beds of mortar are far stronger than cubes, and single bricks than built walls.

The compressions recorded are very small, owing to the rigidity of the mortar, but piers laid in lime mortar give very much greater compressions per unit load.

TESTS OF BRICK PIERS.

McGILL UNIVERSITY LABORATORIES, MARCH, 1897.

Dimensions of Pier.	Mortar.	Brick.	Crushing Strength, lbs. per square inch.		Age.	Failure.		Compression per foot.		Strength of Mortar. 3 in. x 3 in. cube.
			At 1st Crack.	Maximum Load.		Initial.	Final.	400 lbs. per square inch.	800 lbs. per square inch.	
8.1 ins. x 8.1 ins. 11.6 ins. high. Joints, 1/2 in. thick.	1 Canadian Portland. 3 Sand.	Ordinary well-burnt Flat Brick.	882	1,234	3 Weeks.	In the Brick.	In the Brick.	.001 ft.	.0035 ft.	711
8.1 ins. x 8.1 ins. 11.6 ins. high. Joints, 1/2 in. thick.	1 German Portland. 3 Sand.	"	990	1,830	"	"	"	"	"	"
8.3 ins. x 8.3 ins. 10.5 ins. high. Joints, 1/2 in. thick.	1 English Portland. 3 Sand.	La Prairie pressed, Keyed on one side.	1,190	1,524	"	"	"	.0035 ft.	.004 ft.	"
8.4 ins. x 8.4 ins. 10.75 ins. high. Joints, 1/2 in. thick.	1 Belgian Portland. 3 Sand.	"	1,204	1,985	"	"	"	.003 ft.	.0045 ft.	677

N. B.—The crushing strength of a brick similar to those in piers Nos. 1 and 2, laid on flat and bedded in plaster of Paris, was 1,400 lbs. per square inch for first crack, and 2,400 lbs. per square inch maximum load.

The American Schoolhouse. IV.

BY EDMUND M. WHEELWRIGHT.

IN the Hopedale and the Longfellow Grammar Schools we have an opportunity to compare the features and consequent differences of cost of two schools of the same type, built by the same architect, one in the country and the other in Boston, under the requirements of the building laws of 1892.

The Hopedale is a three-story building, with eight schoolrooms and an assembly hall. The exterior walls 16 ins. of brickwork first story and 12 ins. above, both walls with 2 in. air space, and are 20 ins. of brickwork first story and 16 ins. above. The walls of Longfellow School are also vaulted. The floors of the Hopedale school are calculated to carry a live load of 70 lbs. per square foot; those of the Longfellow School, 150 lbs. per square foot. The first floor of this school is mill construction, and the floors of corridors are of fire-proof construction.

The basement floors of Hopedale school are finished in concrete; of the Boston school, asphalt. Both schools have carrying partitions of brick, and minor partitions of spruce studding. The Boston school has three-coat plaster work and wire-lathed ceilings in assembly hall and boiler room; the other school has two-coat work and wood lathing throughout. The Boston school has double run of sash in schoolrooms, which are fitted with bookcases, and the walls above blackboards, and ceilings throughout are tinted with water color. These features are lacking in the Hopedale school.

Both buildings have iron stair-

cases with rubber mats, both have sheathed dados and plain $\frac{3}{4}$ in. baseboards.

The Hopedale school cost \$27,320, or \$4,553 per schoolroom.

The Boston school cost \$68,308, or \$5,692 per schoolroom.

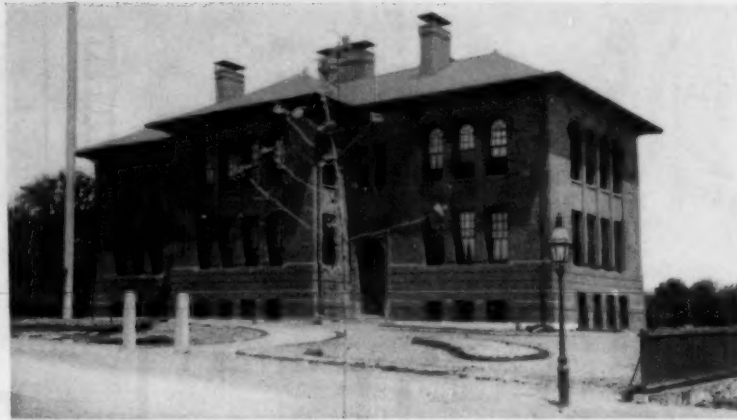
To account for this difference in cost, the first element to be considered is that of the greater expense of building in Boston above that in other places. This would be at least 5 per cent. of the cost in this case. We would, therefore, expect to build at Hopedale a building identical in all its features with the Boston school for \$5,307 per schoolroom.

If the Hopedale school had been planned with separate "ward-rooms," it would have cost \$2,200 more, or \$275 per schoolroom, *i. e.*, the cost would have been \$4,828 per schoolroom; and further, if the Hopedale school had had as heavy brick and foundation walls, and the same

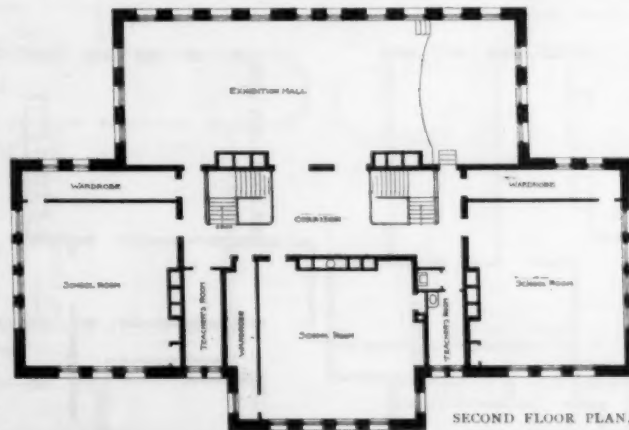
strength of floors as the Boston school, the cost per schoolroom would have been increased \$350, or to \$5,178, and the general increase in cost of the building, if the Boston building law of 1892 had been followed in the construction of the Hopedale school, would

have been \$250 per schoolroom, or to \$5,428. If the Hopedale school had had fire-proofing between floors, asphalt floors instead of cement in basement, double instead of single run of sash in schoolrooms, three-coat plaster and wire lathing of boiler room and assembly hall, bookcases in schoolrooms, and walls and ceilings above blackboards tinted,—factors of increased cost existing in the Boston school,—the cost per schoolroom would have been increased to \$5,698.

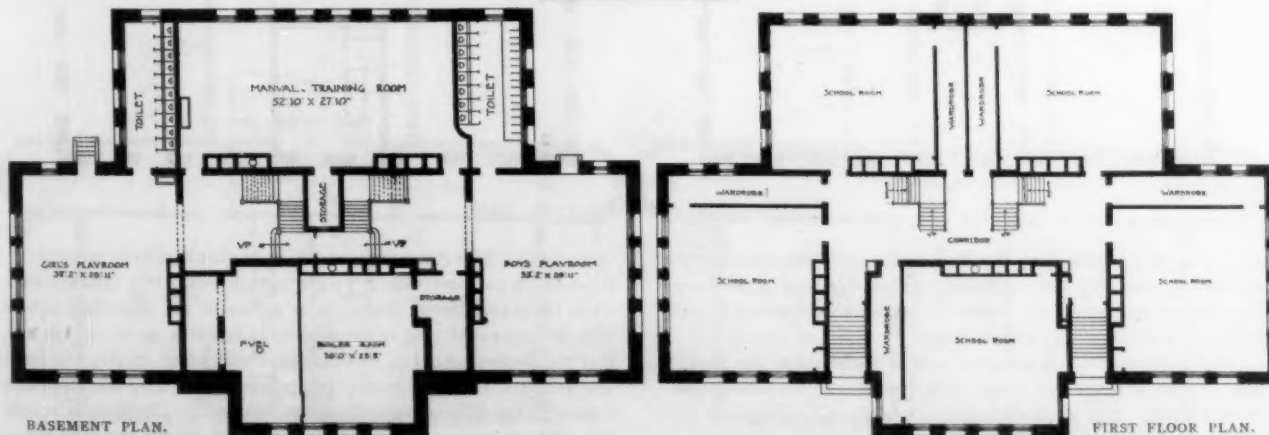
The Hopedale school was heated by indirect radiation. The



ROBERT GOULD SHAW SCHOOL, BOSTON, MASS.
Edmund M. Wheelwright, City Architect.



SECOND FLOOR PLAN.



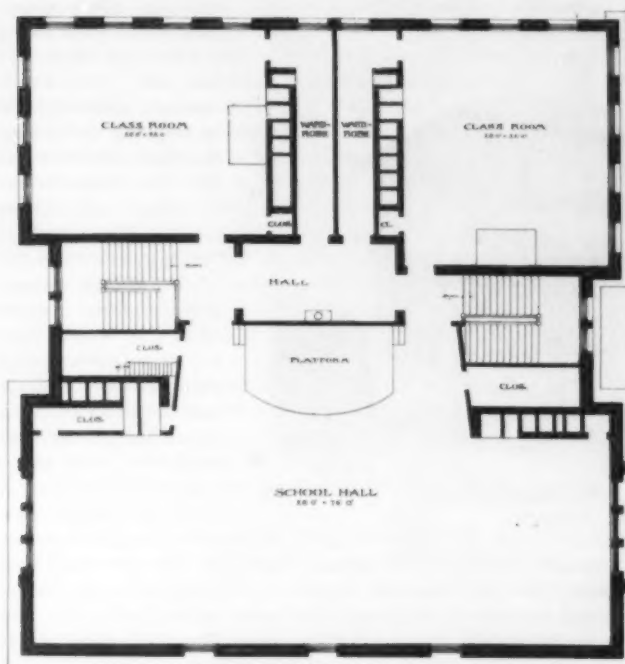
BASEMENT PLAN.

FIRST FLOOR PLAN.

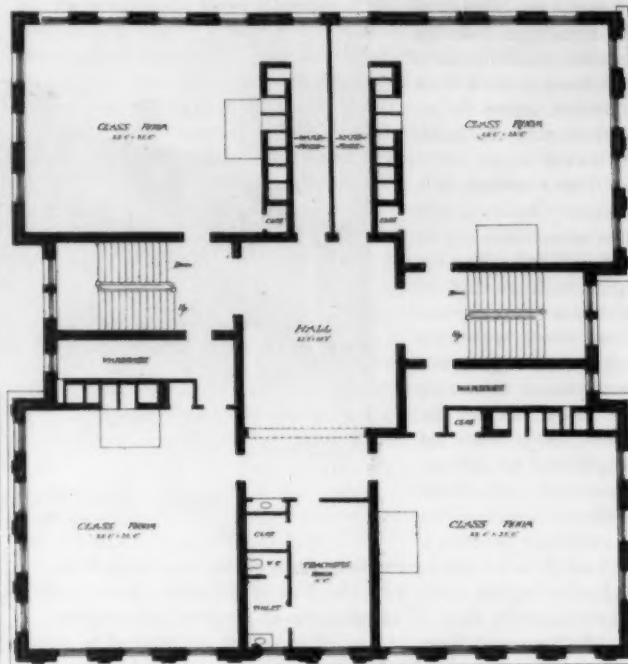
ROBERT GOULD SHAW SCHOOL, BOSTON, MASS.

Boston school had a more perfected system of heating and ventilation, *i. e.*, the heating by direct radiation, and fresh air heated to 70 degs. supplied by a plenum fan. The cost of the heating plant of the Hopedale school was \$2,700, or \$335 per schoolroom; the cost of that of the Boston school was \$7,854, or \$655 per school-

normally 4 per cent. cheaper than the Hopedale school; we therefore leave unaccounted for \$388 per schoolroom. It is evident that the Hopedale school, while less fully meeting the requirements of plan of the best graded schools, as it lacks separate wardrobes and has not certain important minor features, is more expensive in its architec-



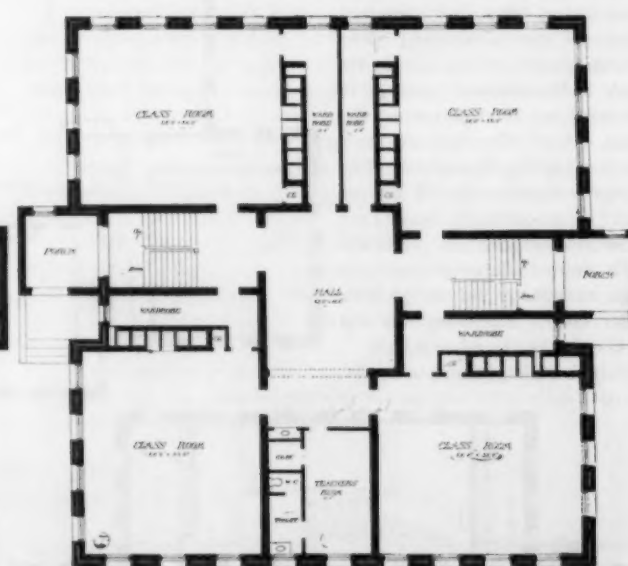
THIRD FLOOR PLAN



SECOND FLOOR PLAN



BASEMENT PLAN



FIRST FLOOR PLAN

LONGFELLOW SCHOOL, BOSTON, MASS.

room. Let us suppose that the Hopedale school had been further improved by a heating and ventilating system like that of the Longfellow School, and we should expect a cost per schoolroom for such a building, with the other elements above premised, of \$6,018.

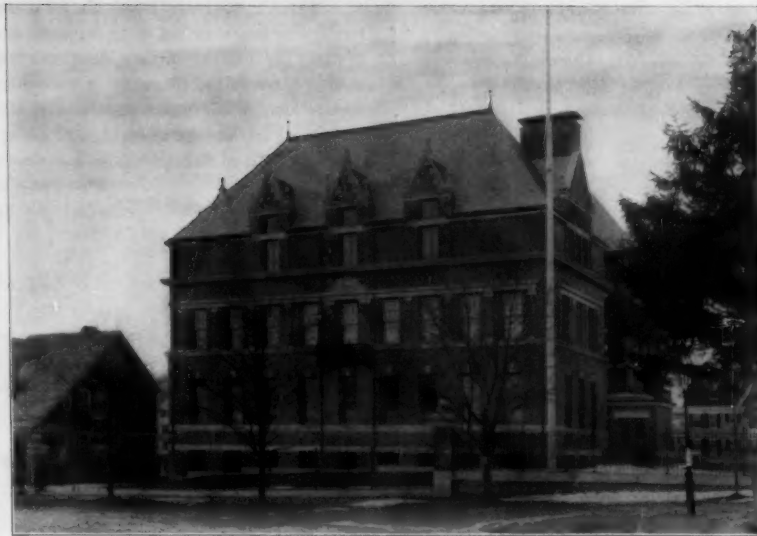
We have seen that the expected cost of a school like the Boston school, if built in Hopedale, would have been \$5,307 per schoolroom. It would appear that there was a difference of cost in favor of the Boston school, if both schools are considered fairly, of \$711 per schoolroom. The greater size of the Boston school would make it

tural detail. This extra expense, which is mainly in cut-granite work, is probably not less than \$175 per schoolroom. We thus see that, when fairly considered, that even if we credit the Hopedale school with its increased cost of architectural features as an advantage, that the Boston school is, when credited with value received in desirable features, \$213 less expensive per schoolroom than the Hopedale school. In addition there should be credited to the Boston school fully \$200 on account of the expense entailed by the required use of the "cart-wheel" form of plan. It may be said in passing that this

form of plan, while permitting the teacher to sit in all cases with back to a narrow end of a schoolroom and yet keep the principal light on the left of the pupils, has the disadvantage of increasing the cost of construction and of preventing a symmetrical external design. The latter consideration is, of course, a minor one if the method of lighting and control of the schoolrooms proves in practise to be bettered by such arrangement.

The Longfellow School deserves further credit on account of the fire-proof construction of its corridors.

Let us compare the cost of the Longfellow School with that of another Boston grammar school built in its neigh-

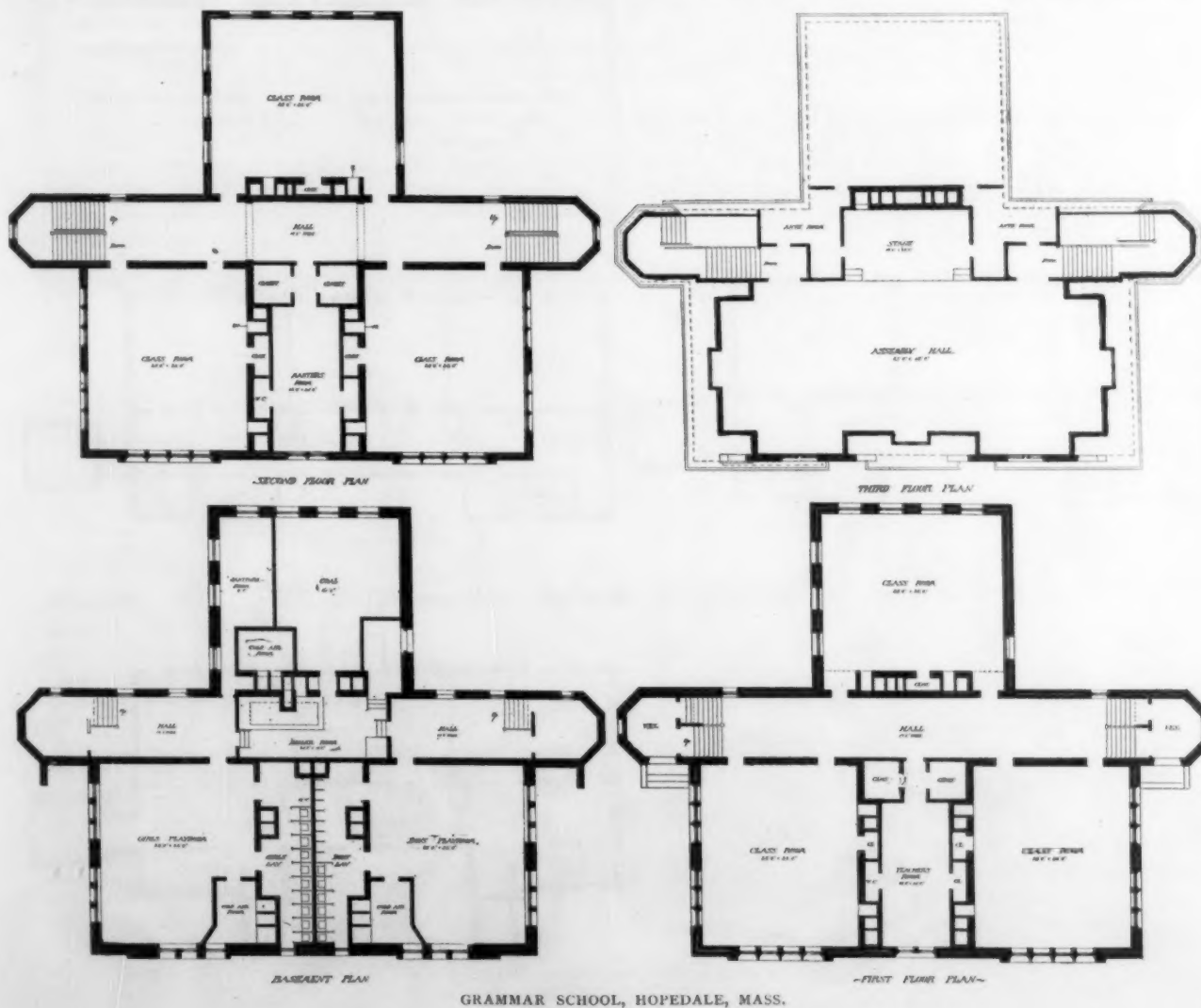


LONGFELLOW SCHOOL, BOSTON, MASS.
Walker & Kimball, Architects.

borhood previous to 1892—the Robert Gould Shaw School. This is a building two stories in height, of eight rooms and assembly hall, costing \$54,215, or \$5,421 per schoolroom. We have seen the Longfellow School cost \$5,692 per schoolroom.

We would expect that the Longfellow School, being larger, would cost 4 per cent., and being built under the requirements of the law of 1892, would normally cost 7 per cent. more, *i. e.*, that in this comparison that the Longfellow School should be credited with 3 per cent. of its cost. We therefore credit it with \$160 per schoolroom, setting the

cost, for purpose of fair comparison, at \$5,532 per schoolroom.



GRAMMAR SCHOOL, HOPEDALE, MASS.

The Longfellow School lacks certain desirable features existent in the Shaw School, *i. e.*, terra-cotta lumber minor partitions, cement finish in place of wood, wire-lathed ceilings throughout, hospital instead of ordinary $\frac{7}{8}$ in. baseboard. These features add about \$60 to the cost per schoolroom, so that to make fair comparison with cost of Shaw School, we should add this amount to the cost of the Longfellow School, making its probable cost, if built under the same law and of the same number of schoolrooms, and under the same specifications as the Shaw School, \$5,592 per schoolroom.

The Longfellow School should be credited with its increased cost, due to the adoption of the "cart-wheel" plan, \$200, to which should be added \$170 per schoolroom on account of fire-proof hall and corridor floors.

With this credit given, the unaccounted difference in cost between the Longfellow and the Shaw School appears to be \$100 per schoolroom in favor of the former school.

The cost of the heating and ventilation of the Shaw School was \$564 per schoolroom, or \$91 less than that of the Longfellow School. It is probable that the latter school had a greater amount of direct radiating surface, as the Shaw School relied for heat as well as fresh air mainly upon its plenum fan, which was supplanted in the more exposed rooms only by direct radiation.

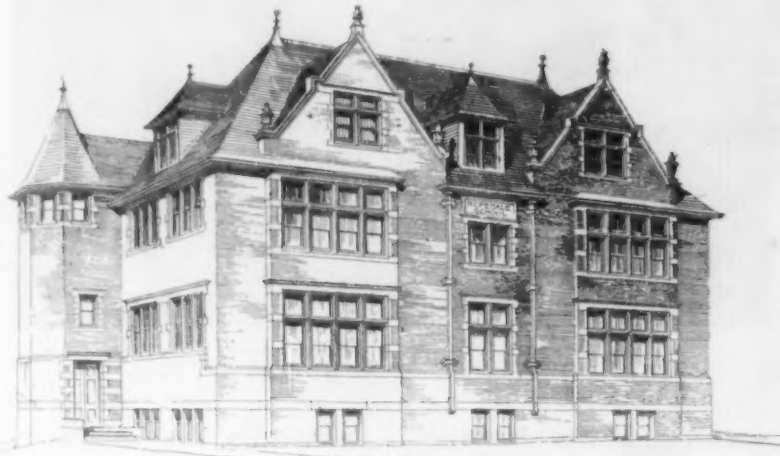
The Shaw School is certainly somewhat less expensive in its external treatment, as but little cut stone is used. If it were profitable to carry the analysis further, we would probably find the net difference in cost between the two schools accounted for by the greater proportionate amount of foundations and external brick wall in the Shaw School, which has the advantage of being two instead of three stories in height, and of not having its assembly hall in the roof.

To more fully establish the fact that where requisite prudence and skill is shown by their designers, the cost of schoolhouses is due to the necessary cost of the features required therein, we will compare the cost of two six-room primary schoolhouses,—the Sewall School in Brookline, and the Margaret Fuller in Boston.

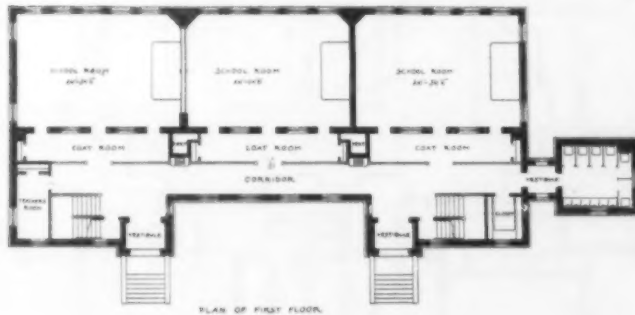
The Fuller School was constructed in accordance with the methods recommended in an earlier paper of this series, and was built under the law which held in Boston previous to 1892. The cost was \$6,220 per schoolroom.

The Sewall School cost \$5,557 per schoolroom.

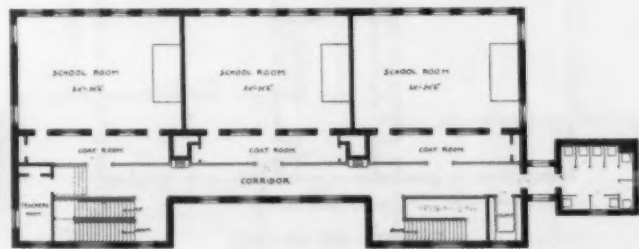
A marked variation of the plan of the Sewall School from that commonly found is the adaptation of the toilet-room tower, a feature of some hospitals. The wardrobes are placed in the corridors enclosed in with screens, as in almost all Brookline schools, and as is, I should judge, the well-nigh general practise in Massachusetts outside



GRAMMAR SCHOOL, HOPEDALE, MASS.
Walker & Kimball, Architects.



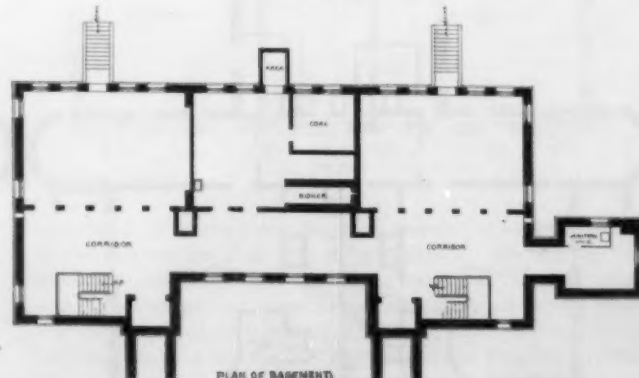
PLAN OF FIRST FLOOR.



PLAN OF SECOND FLOOR.



SEWALL SCHOOL, BROOKLINE, MASS.
Cabot, Everett & Mead, Architects.



PLAN OF BASEMENT.

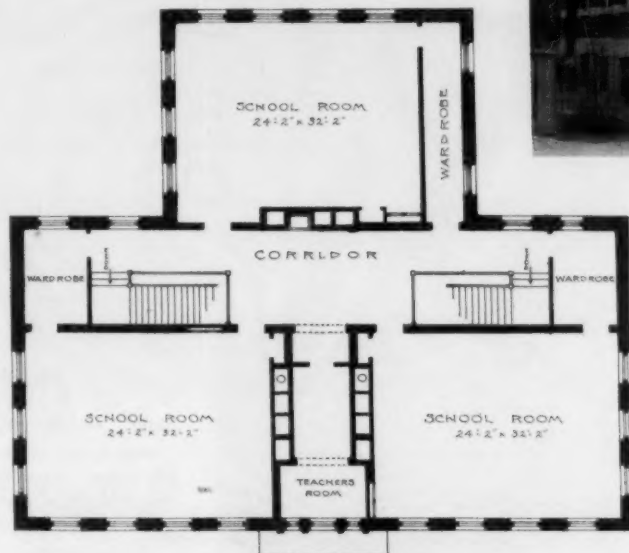
of Boston. It differs from the Fuller School in the following points of construction:—

The exterior walls are 12 ins. with 2 in. air space; the interior bearing walls are 8 ins. instead of 12 ins., as in the Fuller School. The sashes are single run, minor partitions are of studding, except ceiling of boiler room, which is wire lathed; all plastering is on wooden laths, the staircases are of wood, the interior finish is of whitewood, the dadoes are of sheathing, and ordinary baseboards are used. The basement floor is of concrete.

If the Sewall School had been constructed as was the Fuller School the features used as substitutes for those noted above would have increased its cost \$900 per schoolroom; *i. e.*, if its construction had been that of the Fuller School it would have cost \$6,457.



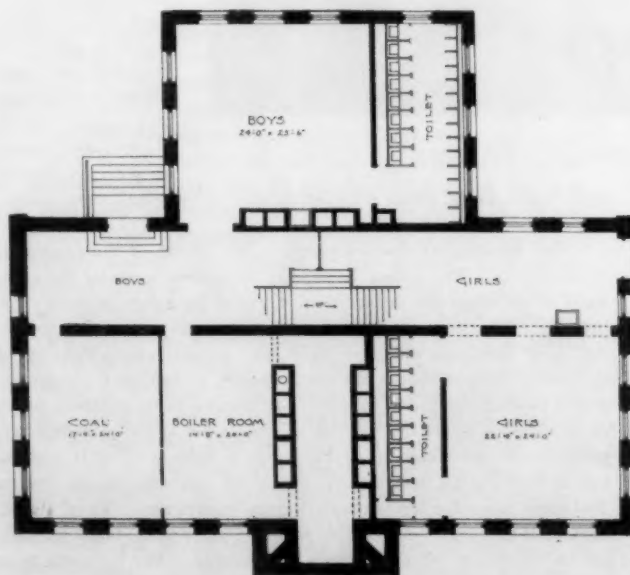
MARGARET FULLER SCHOOL, BOSTON, MASS.
Edmund M. Wheelwright, City Architect.



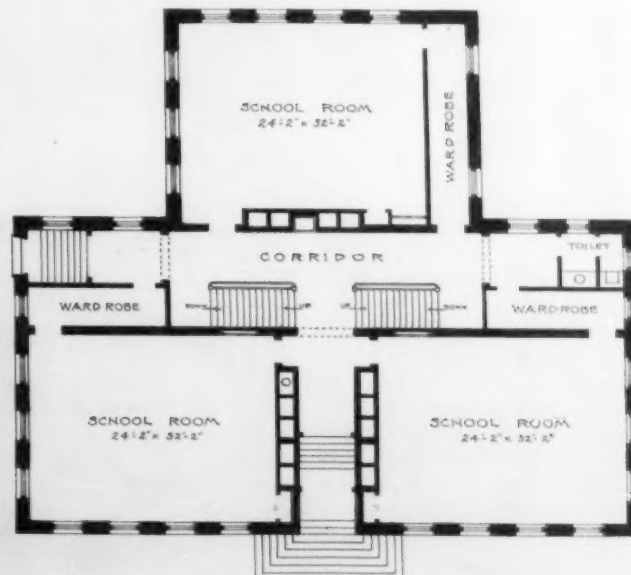
SECOND FLOOR PLAN.

This excess of cost is probably due in part to the greater length of schoolrooms,—in the Sewall School, 34 ft. 6 ins., instead of 32 ft.,—but more to the toilet-room tower, a feature which scarcely appears to be worth the increased expense, unless the space required for toilet rooms in the basement is needed for some other purpose, for there is no disadvantage in having the plumbing fixtures in the basement providing they are properly ventilated, as they readily may be, without any cost for ventilation, as will be later shown.

The omission of the middle window in the wall immediately facing the teacher is noteworthy in this plan. It is a method often found in French schools, and would appear to afford sufficient relief to the teacher's eyes to take away the excuse of pulling down the shades in the windows on this wall, as is often done, to the injury of the proper diffusion of light in the schoolroom.



BASEMENT PLAN.



FIRST FLOOR PLAN.

MARGARET FULLER SCHOOL, BOSTON, MASS.

Brick and Marble in the Middle Ages.

BY G. EDMUND STREET.

(Reprint.)

I HAVE already spoken of the exquisite beauty of the inlaid marble in St. Mark's; nothing can be better than their effect, and nothing seems more wonderful than that they should not have been used more frequently in later buildings. I was, perhaps, a little disappointed in not finding, as I had expected, the marble arranged generally in geometrical patterns; but this is quite the exception; and one sees only, in a medallion here and there, the exquisite beauty which their arrangement in this way may produce. As a rule, the walls are faced with thin slabs of marble, each of the size in which it came to hand, sawn into as many slices as its substance would allow, and then riveted to the walls and held in place securely by projecting thin lines of stonework built into the wall, and cut with indented or billet ornaments along their edges. There is, however, a degree of real as well as apparent weakness which is not at all satisfactory in this system of incrustation, and I thought how much more noble such work might well become, were it to be inlaid only where no strong work was required to be done — as, *e. g.*, in spandrels of arches,¹ or within arches — and not, as here, to the concealment of every one of the necessary constructional features. It is to be observed, however, that the slabs of marble are generally higher than they are wide, so as at once to destroy any thought of their being really constructional.

The south side of St. Mark's is, perhaps, the place above all others in Venice where this inlaid work may be seen to the greatest advantage. Some of the great arches which stand in place of gables are divided into four or five square-headed lights by shafts supporting semicircular arches, the tympana of which are filled in with delicate and perpetually varied filigree work in marble, whilst above them a succession of panels or medallions shows all the resources of the rich materials which were to be exhibited. In another case, just over the entrance from the Piazzetta to the church, the tympanum of the arch is filled in with large medallions, one exquisitely carved, the others plain; whilst the arch of the window below the tympanum has its beautiful marble spandrels adorned on either side with medallions, which, for exquisite arrangement of vari-colored marbles in geometrical patterns, are perfectly admirable. There is enough, therefore, in the Venetian system of incrustation, though much unhappily be lost, to give ample food for our study and admiration; and its only weak point is, as I have said, its too frequent neglect or concealment

¹ It was only so used in the Ducal Palace.

of the constructional features of the buildings it adorns. It is easy, however, to cavil at particular details, and scan with a critical eye the architectural beauties of Venice; but let it not be thought for an instant that all the wonderful pictures which every new turn or new point of view brings before the eyes are unappreciated. A few days spent there suffice almost to fill a lifetime with reminiscences of all that is novel, beautiful, and strange; and days such as I have spent, year after year, rejoicing in the daytime in the full brilliancy of a September sun, and at night in the calm loveliness of a Venetian night, have been just the most delightful in every way that could be passed.

We were at Venice on the festival of the Nativity of the Blessed Virgin, — a great feast day, which it had been my fortune to spend some two or three times before in Roman Catholic countries. I confess that here we were not edified. We came in, as we went from church to church, for rather more than the usual number of the *dé-sagrémens* which always seem to attend the decoration of the churches,

and especially the altars, "for such festivities abroad. The strongest impression left on my mind was one of wonder at the paltry character of the long array of what by courtesy are called, I suppose, wreaths of flowers, manufactured of pink gauze, or some equally unnatural material. These, with vulgar draperies hung outside the church doors, and in additional quantity about the altars, with the most noisy and gladsome ringing of bells, completed the external demonstrations; all the shops were most studiously closed, and the churches and open places were thronged with people. At St. Mark's, we heard² some abominably



ST. MARK'S, VENICE. WINDOW IN WEST FRONT.

light opera music, which sounded, as may be imagined, very discordant within its solemn walls.

One morning we devoted partly to the ascent of the campanile in the Piazza. The ascent is entirely by inclined planes; the outer walls of the tower are, in fact, double, and in the space between them these inclined planes are formed, and it is worth notice that to this day, in all buildings which we have seen in progress in this part of the world, inclined boards are used instead of ladders for obtaining access to scaffolding, and in one of the mosaics in the entrance porch of St. Mark's, where the building of the Tower of Babel is depicted, precisely the same kind of arrangement is shown. This is interesting, as showing the tenacity with which old customs are adhered to. The view, when the top is reached, quite repays the labor of the ascent, as it gives the best possible idea of what Venice really is. We get an impression of a very densely populated town, hemmed in on all sides by water, and looking very flat and low; in the distance small islands pave the way to the mainland, or shelter us from the

² I have heard a polka played by the organist in St. Mark's!



ST. MARK'S, VENICE. THE NORTHWEST CORNER.

sea; these, where they are more distant, look like mere black spots on the smooth, unrippled expanse of water, and in the far horizon we see to the west the purple outline of the mountains about Vicenza; and to the north of these, and rising grandly into the sky, the snowy peaks of the southern range of the Friulan Alps. Below and around are countless churches, all placed confusedly without respect to orientation—a neglect, if anywhere excusable, surely so here, where land is the exception and water the rule.

The last day we spent in Venice was most enjoyable. We had been all day in our gondola, now stopping to sketch some Gothic palace, anon shooting into some narrow canal to escape the bright heat of the sun, winding our way now here, now there, just as the fancy of the moment siezed us, and realizing more than ever that "the longest summer's day was all too short" for a last day in so fair a place. In the evening, just before sunset, we went out into the Lagoon, and, rowing round the small island of Giudecca, watched the gradually waning light reflected on the smooth, calm water, which seemed too silent and too soft to be disturbed by a word from any of us; and then at last, turning back and coming suddenly through a short canal into the main stream just opposite the Dogana, we moved on gently till we came abreast of the Ducal Palace. The moon was rising behind us in all her beauty, and in front, lamp after lamp was suddenly lit along the Piazzetta, then along the palace front, all along the Riva dei Schiavoni, until at last, before we landed, the bright lights, reflected in a hundred gleaming, flashing lines, were fitfully dancing in long streams of light upon the bosom of the waters.

We stepped on shore, to find ourselves led on by the sound of military music, and to be tempted by the luxury of ices eaten *al fresco* in the Piazza; and then, when the crowd gradually dispersed, we, too, among the last, found our way to our hotel, charmed so much with our last night in Venice that it is impossible not to recollect that evening with the deepest pleasure.

It is not without purpose that I have held silence with regard to the churches and buildings generally of the Renaissance school in Venice. These have had in their time many more admirers than have the examples of architecture which it was alike my business and my delight particularly to examine; and to the present day I doubt not that nine people out of ten, led by their *valets-de-place*, go to see what is worst in point of taste, and so reap the reward of allowing themselves to be made to see with another's eyes, instead of enjoying the intense pleasure of working out and exploring for themselves all the treasures of this mine and storehouse of ancient art. It is partly because I feel the greatest repugnance to the buildings themselves, and partly because I fear to make my notes, already lengthy, far too long for the patience of my readers, that I do not venture upon this additional field of study; but not in the least degree because I doubt the result, for I believe firmly that, tried by the fair rules which must regulate merit in a constructive art, the Renaissance buildings of Venice would be no nearer perfection than those of any other city. Something perhaps there is in the gloomy grandeur of their vast masses, rearing their rusticated walls and deeply recessed windows darkly above the comparatively cheerful and bright-looking walls of the neighboring Gothic palaces, which may impress the minds of some, but they must be of a somber temperament who really love them. Still more must they be of a tasteless temperament who can endure with patience the succession of eccentricities with which Palladio and his disciples have loaded their churches. I pretend not, however, to discuss the point. I had not time for everything, and preferred giving up the attempt to like what from my heart I have ever disliked, and what nothing that I saw in Venice would make me dislike at all less heartily.

Neither do I pretend to say anything about Venetian pictures; guides without number may be found of more service and more knowledge, and to their hands I leave their proper charge. A word



ST. MARK'S, VENICE. SOFFIT OF ARCHIVOLT OF CENTRAL DOOR, MAIN FRONT.



ST. MARK'S, VENICE. VIEW IN THE NAVE.

only upon one point—their adaptation, namely, to the sacred edifices of which they are the most notable ornaments.

Now I must at once say that there is no church, so far as I saw, in Venice, with the single exception of St. Mark's, which is to be compared in this respect (in its effect, that is, as heightened by color) with such buildings as the Arena Chapel at Padua, or the church of Sta. Anastasia at Verona—the one an example of the very noblest art working under strict architectural limitations; the other, of simple decorative painting. The fact is, that the Venetian pictures give the impression that they might do elsewhere as well as in a church, and therefore entirely fail in identifying themselves with the walls on which they hang; whilst no one can ever think of the noble works of Giotto at Padua without recalling to mind the religious order of his works and their identification with the building which contains them; and at Verona the result of the system adopted in the painting is marvelously to enhance the effect of the architecture without in any way concealing or damaging it. In Venice the case is quite different. The church of San Sebastiano, in which Paul Veronese is buried, and which internally is almost entirely covered with his paintings, is an example of what I suppose I must call the best Venetian treatment. This consists, however, of immense oil paintings covering entire walls, and absolutely requiring, in order that they may be at all properly appreciated, that the spectator should stand in a particular spot,—in some cases by the side of the altar,—and that the windows should first have blinds drawn down, and then, when he goes to look at another painting, have them drawn up again. This is all very unpleasant. But besides this, there is no very sensible advantage to the color of the buildings from these decorations: certainly they are far behind mere decorative paintings as vehicles for bringing out the architectural features; and so they are visited very much as pictures in a gallery, and without in any case being identified with the churches in which they are preserved. The mosaics at St. Mark's are, on the other hand, some of the very grandest examples of the proper mode of decorating interiors with representations of religious subjects, all conceived and arranged with some order and relation to each other. But of the other Venetian churches there does not seem to me to be any one whose artists at all succeeded in equaling the example so early set them.

I do not pretend, in these pages, to speak at all of paintings irrespective of architecture, or I might find much to say upon the store of works of a very noble school in which this great city is so rich. The immense rooms of the Ducal Palace, covered as their walls and ceilings are with the works of Tintoretto, Titian, and Paul Veronese, cannot be forgotten, still less can the many works of Giovanni Bellini, and of other painters in the churches, and in the collection in the Accademia—rich among others in the works of that great and interesting painter, Carpaccio,—be passed over, whilst the decorated walls of the various Scuole are in many cases of hardly inferior interest. I am sorry that I was obliged to take the great merits of some of the grandest works somewhat on faith; it was in vain to think of actually studying them in a short time, and, educated as I have been, to love the works of an earlier date and another school more heartily than these, I must confess, barbarous as the confession may appear to be, that I was not thoroughly pleased with what I saw. The magnificence of the chiaroscuro and coloring of these great pictures scarcely atoned to me for the degree to which, owing generally to the immense array of figures and confusion of subject, I failed to carry away distinct conceptions of the story intended to be told. It may be said that this is the result of want of taste or education, but still the feeling is so different when for the first time pictures by Fra Angelico, Giotto, Raffaello, Perugino, or Francia are looked at, that it is hard to avoid believing that, though their power over color may have been somewhat less, their power of attaining to the highest point of the true painter's art, that of leaving indelible impressions on the minds of all beholders, was immeasurably higher. Thus much only by way of excuse for not saying more about what the world in general rightly conceives to be one of the great glories of Venice.



ST. MARK'S, VENICE. THE NARTHEX.

Fire-proofing.

THE LIVINGSTON BUILDING FIRE.

A PROPOS of the recent fire in the Nassau Chambers in New York, Chief Bonner is quoted as saying that there is no such thing as a fire-proof building. The experience of the Livingston Building points to a very different conclusion. This structure was designed and erected by Hill & Turner, in New York, and has been occupied for about a year for light manufacturing purposes. The building is fire proof in its construction according to the most approved types. The beams are protected by 8 in. end construction, hard, hollow-tile arches of spans of about 6 ft., the bottom flange of the beams being protected by the terra-cotta being carried underneath. Each story is practically undivided, a narrow stairway being carried along one of the party walls adjoining the elevator, both the stairway and the elevator being enclosed by a solid plaster partition. The doors and door casings are of wood covered with asbestos and a surface of metal. Late in the afternoon of January 18 a fire was discovered in the fourth floor, which was occupied by furriers, and was stored full of highly combustible material, besides having a quantity of low wooden partition work. The outside windows on two streets were quite large and the glass was speedily broken so the flames had ample supply of air, and all the conditions were favorable for developing an intense heat. The fire had headway of about twenty minutes before the firemen were able to get at it, and there is abundant evidence of the extreme heat developed, as shown by the brass castings of some of the steam radiators which were melted entirely off, as well as by the fact that the steam pipes became so softened that they sagged out of shape. In fighting the fire, three or four lines of hose were carried up the stairway and jets of water directed from the door opening directly into the undivided room. Tarpaulins were banked up across the inside of the threshold to form a dam, which enabled the firemen to flood the whole story with water until it ran over outside the window sills. A water tower also threw a heavy stream of water in from the outside.

The contents of the story and the wooden finish were destroyed. In one place on the ceiling, in such location as would indicate that it was a special focus for the streams from the firemen's hose, a section of the bottom flanges of the floor arches was broken or burned away, this whole section being somewhat less than 3 ft. square. The vertical webs of the terra-cotta were intact. At another position near one of the outside windows, a space of a few inches square was missing from the bottom flange of one of the floor arches. As far as could be ascertained, this was the only damage to the terra-cotta. The ceiling throughout was heavily plastered with machine-mixed mortar. This plastering had come off in a number of places, but nowhere, except at the points mentioned, was there any appearance of damage of any sort to the terra-cotta. None of the ironwork seemed to have been affected a particle. The flames lapping outside the building communicated to the upper story, but beyond the smoke and water no damage was done above the floor in which the fire started. In the story below, occupied by a tailor shop and crowded by material, a relatively slight amount of water came through from above, but not sufficient to cause any damage. The heat against the outside walls in places was so intense that over considerable areas of the brickwork, which is of hard, thoroughly well-burned red brick, the surface was entirely gone for a depth of from one eighth to one fourth of an inch. On the exterior of the building, which is finished entirely in brick and terra-cotta, there was some damage to the projections of the belts and cornices in the lower stories caused by the firemen. In a few places, also, the corners of the brick piers in the fourth story were slightly corroded by the heat, and, of course, the smoke made the building appear to be damaged considerably in the upper stories. The extent of the structural damage, however, can be appreciated by the fact that though the building cost over \$100,000, we are informed that the insurance companies have offered to settle all the fire loss

for \$5,600. The fire occurred on Wednesday afternoon. The following morning the electric plant and the elevator were in operation and constant use, and on Friday morning manufacturing was started in the lower story.

There was sufficient heat developed to have utterly destroyed any ordinary construction, and the lessons of this fire are particularly valuable as showing that it is perfectly possible to so construct a building with terra-cotta rightly used that no fire from within can any more than burn out the contents.

REPORT ON A RECENT FIRE-PROOFING TEST.

WE have had occasion to make several comments upon tests of building materials, and though the subject is one which probably will never be permanently settled, and there will always be an irrepressible conflict between the various mediums which are used for the fire-proofing of building constructions, and differences of interpretations of tests, no less than the differences of measurements of values, will always be biased by the point of view, we feel that, in justice to the burnt-clay industries which we represent, it is fair to call attention to some points which ought to be considered in forming a judgment of a recent comparative test in New York. Our readers can draw their own conclusions as to the value of such tests and the importance thereof. On November 19 a fire test was made of two constructions, one a suspended concrete system and the other a terra-cotta block end construction. The terra-cotta was purchased in the open market, and theoretically represented the product that is put forward by the manufacturers; but the deductions from the results of the test were so at variance with recognized facts that Mr. H. M. Keasbey, the president of the Central Fire-proofing Company in New York, felt that it was desirable to investigate a little more closely the conditions under which the terra-cotta was tested. This investigation was conducted by Mr. Julius Franke, architect, who reported as follows:—

"On October 19, when I made my first inspection, the hollow-tile arch had been built, and as no concrete had then been put on top of the same, I noticed that the key of the arch was not in the center, that tiles of different patterns, not made to be built into the same arch, were used, and that some of the cement mortar which I took off the top was very poor, the same crumbling between my fingers.

"I found that the concrete arch, which had been built alongside of the tile arch as per drawing attached hereto, was so placed that if the space, about one fourth of an inch between the plates, marked 'A' on the drawing, were filled up, the expansion of the concrete arch, which could be caused by fire, would deflect the beams, causing a lateral thrust along the top of the hollow-tile arch. This would cause damage to the latter, particularly as its key was not in the center.

"After the fire test I examined the arch again and found that the middle third, including the skew-backs, had fallen, and that the two thirds remaining had joints open at the bottom; but that most of the mortar with which the bottom of the tiles had been plastered had remained on the tiles, and that the space between the plates marked 'A' on the drawing had some cement or mortar in the same. I also found that the concrete filling on top of the arch was very poor, not being strong enough to resist any strains.

"The fact that the mortar remained, and also that the sides of the kiln or oven were damaged very little, showed that the damage done to the arch by fire must have been very slight. I therefore came to the conclusion that the arch failed because it was improperly built, having the key off the center, being constructed of different patterns, and because the cement was not of the best; and also because when the concrete arch and concrete beams formed by boxing the tie-rods became hot they expanded and caused a movement in the joints of the tile arch by a lateral thrust. This weakened the arch sufficiently to allow the weight which was on top to act upon the arch block marked 'X,' causing it to slide and break the arch.

This could all the more readily happen as the style of arch employed was an end construction of a pattern that had very little bearing surface at the joints of the arch, and very little or no side bond, and also because the concrete filling was very poor; so that if only one key or arch block gave way and let down its load, the rest would follow, particularly with a load of cobble stones such as was on this arch."

This report and the results of the test seem to emphasize what is admitted by all experts on fire-proof material, namely, that terra-cotta, though of itself admittedly a perfectly satisfactory medium for fire-proofing, must be set right in order to accomplish its purpose, and that no test of a material is reliable which shows failure to be caused by improper workmanship.

FAILURE AND EFFICIENCY IN FIRE-PROOF CONSTRUCTION.

UNDER the above title an article appeared a short time since in the so-called technical department of the *Architectural Record* which undertook to compare some existing systems of fire-proof construction, drawing conclusions therefrom that terra-cotta was a failure as a fire-protecting medium, and that the only proper material to use was a system of concrete construction as designed and applied by a particular firm. The fact that the article in question appeared in what would more properly be styled the advertising department of the *Record*, and that it was evidently inspired by the firm whose product was placed at the head, robs it of its value as a statement of exact conditions. It is perhaps hardly worth while to undertake a criticism of an advertisement except in as far as appearing in the form referred to it may have seemed authoritative. It takes up terra-cotta, weighs it in the balance, finds it wanting, and summarily disposes of it so that nothing is left; and yet, strange to say, the very instances which the article quotes as demonstrating the failure of terra-cotta are the very ones which are quoted by the warmest advocates of burnt clay, to support their claims in regard to this material as a fire protector. On the other hand, judging from this article, concrete is impregnable, and whether attacked by fire or water, no matter what the degree of exposure, it is absolutely unyielding. Now a little common sense will show that this is not a correct statement. While our position is that terra-cotta affords all the needed protection for the most severe exposures to which any ordinary building is subjected, it is beyond question that even the best of terra-cotta applied in the most thorough way could be destroyed utterly by a sufficient degree of heat; but long before the best kinds of terra-cotta would begin to melt and run down, a condition which, judging by the *Record* article, is a usual concomitant of exposure, any cement construction would be heated to redness if not entirely destroyed, and concrete which is red hot is not a very efficient protection for structural steel work. The question of fire-proof material is really a very simple one, and any one who is so disposed can make the most convincing sort of test by taking a small fragment of ordinary porous terra-cotta and a small fragment of the cinders concrete which is usually employed for concrete constructions, and holding a piece of each in his hands, expose the other end to the flame of a blowpipe. He will drop the piece of concrete first. Some time afterwards he will have to drop the terra-cotta. If while hot they are dropped directly into a bucket of water, the most casual inspection will satisfy any one that what is left of the concrete is hardly the material that is most desired for the protection of a building. Concrete is cheap, terra-cotta is not; therein lies the secret of the possibilities of the use of the former material.

Another point. If terra-cotta arch blocks are set in place with only ordinary care, they can be depended upon to serve their purpose. Concrete, on the other hand, has to be mixed most carefully in order to secure a uniform and reliable product. As, in a large building, the bulk of the work is of necessity entrusted to laborers who can be depended upon *not* to think or be careful, the chances are decidedly against a satisfactory mixture of concrete, thereby largely increasing the odds in favor of terra-cotta.

Mortar and Concrete.

WE publish below a circular recently issued by the Committee of the American Society of Civil Engineers, on the Proper Manipulation of Tests of Cement, and we would specially direct the attention of our readers to the questions contained in this circular and to the request of the committee for information upon this important matter. It is well recognized that the testing of cement, unlike the testing of metals, rests upon a very insecure foundation, and different manipulators succeed in getting from the same material, results varying sometimes by several hundred per cent. It is for the purpose of devising, if possible, some rules of manipulation which will prevent such diversity that this committee has been appointed, and it is hoped that it will receive the support of those who manufacture or use cement. The attention of our readers is specially directed to the fact that copies of the circular may be obtained from the chairman of the committee, who desires that this circular may reach all persons who would be likely to give the committee the benefit of their experience.

BOSTON, Jan. 15, 1898.

Dear Sir:—The Committee on the Proper Manipulation of Tests of Cement earnestly requests that you will give full and careful consideration to the following questions, and that you will, as soon as convenient, send to the chairman complete and explicit replies, giving the result of your experience and the embodiment of your views. Any additional suggestions or information bearing upon the subject which you may desire to communicate will be thankfully received by the committee.

This circular has been sent to every member of the American Society of Civil Engineers, and to many others, but in order that it may reach everybody whose opinion will be of value, you are requested to mention the names and addresses of any persons, not members of the Society, who, in your opinion, should receive it, and who will be likely to assist the committee in its work.

You are also requested to send with your answer copies of any specifications for cement which you may have used, or any other information bearing upon the subject, which you think would be of interest.

As the duties of the committee will require considerable time and labor, you are earnestly requested to respond as promptly as is consistent with a careful consideration of the questions asked.

Yours very truly,

GEORGE F. SWAIN, Chairman;

O. M. CARTER, W. B. W. HOWE, ALFRED NOBLE, L. C. SAHIN, GEO. S. WEBSTER, HERBERT W. YORK, Committee.

Address: Prof. GEO. F. SWAIN, Massachusetts Institute of Technology, Boston, Mass.

SAMPLING.

1. In the works which you have carried out, how much cement have you been willing to accept on the results obtained with a single sample?

If this depends upon the kind of work or reputation of cement, please indicate.

2. What method do you recommend for obtaining a sample from a package?

3. Do you mix cement taken from several packages to obtain a sample to use in testing, or are the samples from the several packages kept distinct?

CHEMICAL ANALYSIS.

4. When do you consider a chemical analysis essential or desirable?

5. What elements or compounds should be determined?

6. What do you consider the best methods of determining these compounds with sufficient accuracy?

MICROSCOPICAL TESTS.

7. Are microscopical tests of value, and, if so, when?

8. What power microscope is required, what observations should be made, and what are the indications?

FINENESS.

9. What sizes of mesh should be used in testing fineness of Portland cement? What for natural cement?

(If these questions are answered by stating the number of meshes per linear inch, please mention, also, the size of wire without reference to any wire gauge.)

10. What should be the diameters or sizes of the screens?
11. How large a sample should be tested?
12. Should any machine for shaking be used, and if so, what form, and what should be its manipulation?
13. How long should the shaking be continued?
14. Should there be any difference in manipulation for fine and coarse screens, or for different kinds of cement?

APPARENT DENSITY OR WEIGHT PER CUBIC FOOT.

15. What is your opinion of the value of this test?
16. What apparatus do you prefer, and how should it be used? (Please state any special precautions to be observed.)

TRUE DENSITY OR SPECIFIC GRAVITY.

17. What is your opinion of the value of this test?
18. What apparatus do you prefer, and what is the method of manipulation? (Please state any special precautions to be observed.)

STANDARD SAND.

19. What kind of sand should be used in tests of mortars? Would you recommend a natural sand or crushed quartz?
20. What fineness should be specified, and what degree of variation in size of grain should be allowed?

PREPARATION OF PASTES AND MORTARS FOR TESTS OF TIME OR SETTING, SOUNDNESS, AND STRENGTH.

21. Should the same method of preparation be used for each test?
22. How should proportions be stated?
23. What should be the consistency of the pastes and mortars for the various tests, and how may this consistency be specified and determined in order that similar results may be obtained by all operators? (This question is intended to embrace, not only the correspondent's views as to what consistency should be used, but also as to devices for determining when the proper consistency has been obtained. It is hoped that this question will receive full and careful consideration.)
24. What should be the temperature of the materials used in mixing?
25. What should be the temperature of the air at mixing?
26. How should the quantity of water used in mixing be defined?
27. What should be the method of mixing?
28. Do you prefer hand or machine mixing? If the former, please describe manipulation in detail.
29. If the latter, what machine do you prefer, or what form would you suggest for trial?
30. Do you know of any machine that has given good results? If so, what is the method of manipulation, and what are its advantages and defects?
31. How long should the mixing be continued? Should this be defined by stating the length of time, or by reference to the character of the resulting mortar?

TIME OF SETTING.

32. What do you consider the best method of determining the time of setting? (Please describe apparatus and manipulation.)
33. How shall the beginning of the set be defined?
34. How shall the end of the set be defined?
35. Should this test be made on neat cement paste, or on mortars, and if the latter, what proportions of cement and sand should be used?
36. What should be the consistency of the mortar? (See 23.)
37. What should be the temperature of materials and of air, quantity of water, and method of mixing? (See 24, 25, 26, 27.)
38. What should be the method of making the pats, or of filling the molds, if they are used?
39. How shall the pats or briquettes be treated during setting?
40. What should be the temperature of the water in which pats are placed?

SOUNDNESS.

41. What do you consider the best test for soundness in the case of Portland cement? What in the case of natural cement? (Please describe

in detail the process recommended, and indicate any necessary precautions to be observed. If the process you prefer is too elaborate for any but a well-equipped laboratory, please indicate, if possible, any modifications for ordinary use, and give your opinion of the reliability of such simpler tests.)

TENSILE STRENGTH.

42. What proportions of cement and sand should be used in mortar for tests of tensile strength?
43. Do you advocate adhering to the American Society of Civil Engineers' form of briquette in future requirements? If not, what form do you prefer?
44. Is your preference based on comparative experiments, or is it the result of satisfactory experience with one form?
45. Upon what sort of a surface should the briquette be made?
46. Should the briquette be finished with a trowel on both sides?
47. What should be the consistency of the mortar? (See 23.)
48. What method of filling the molds do you advise? Do you recommend the use of a machine for molding, and if so, what form would you suggest?
49. Have you used the machine you suggest, and have the results been satisfactory?
50. How should the briquettes be treated during the first twenty-four hours after molding?
51. How should they be treated during the remaining time until tested?
52. If placed in water, how often should the water be renewed, and is it important that it should be maintained at a nearly constant temperature? What should that temperature be?
53. At what age should briquettes be broken for acceptance tests on ordinary work?
54. Under what conditions would you deem it essential to make longer time tests?
55. Will weighing briquettes before testing give information of value, and, if so, what?
56. What form of clip do you prefer?
57. What should be the distance between opposite gripping points of the same clip?
58. What should be the rate of applying the stress?
59. What style of testing machine do you prefer?
60. Can you suggest any desirable modifications to machines now in use?
61. What special precautions are necessary in breaking briquettes?

COMPRESSIVE STRENGTH.

62. Do you advise compressive tests, and, if so, why?
63. What form and dimensions of test piece do you prefer?
64. Should the test piece be treated differently as regards manipulation of mortar, mixing or setting, from tensile specimens? If so, please state in what particulars, and why.
65. How should the specimen be prepared for the testing machine?
66. What form of testing machine do you recommend?
67. What should be the rate of applying the stress?

TRANSVERSE STRENGTH.

68. Do you advise bending tests? If so, under what conditions and why?
69. What form and dimensions of test piece do you prefer? What span?
70. Should the test piece be treated differently as regards manipulation of mortar, mixing and setting, from tensile specimens? If so, please state in what particulars, and why?
71. What form of testing machine should be used?
72. What should be the rate of applying the load?

MISCELLANEOUS.

Under what conditions do you consider the tests indicated below necessary or desirable? What should be the manipulation for the test if used?

- I. — Adhesion.
- II. — Abrasion.
- III. — Resistance to freezing.
- IV. — Resistance to action of sea water.

The Masons' Department.

CONCERNING THE RIGHTS OF CONTRACTORS AND
AUTHORITY OF ARCHITECTS.

IN response to the application of Lynch & Woodward for an injunction against Josiah Quincy *et al.*, Judge Richardson, of the Massachusetts Superior Court, has passed upon the merits of the case in a decision which is of unusual interest to architects, contractors, and mechanics. The facts which led up to the legal proceedings are briefly these: Messrs. Lynch & Woodward obtained the contract for heating a public bath house now being built for the city of Boston, on Dover Street. In their contract with the city was a clause which has of late been inserted in all contracts for city work, providing that "preference shall be given to union labor." Messrs. Lynch & Woodward had up to the time of signing this contract run what is known as a non-union shop—that is to say, they did not discriminate between union and non-union labor in the employment of their help. When these contractors started to perform their work at the bath house they claim that they announced their willingness to employ members of the union to do this particular work provided they could obtain a sufficient number of efficient workmen of this class—that is to say, union men. Apparently the Steam-Fitters' Union thought, under the existing conditions, they had an opportunity to force the contractors to run a union shop, and so union men stayed away from the job. The contractors, after making known their readiness to employ union labor and finding that they could not obtain a sufficient number of skilled mechanics of this class, and having, as they thought, fulfilled the conditions of their contract as regards this particular condition, then proceeded to perform the work with non-union men. The contractors began work under the contract about Nov. 1, 1897. On November 4, and again on November 13, they were ordered to suspend work for a time; finally, on January 8, the mayor caused a letter, signed by the architects, but prepared by him, to be sent to the contractors, ordering them to "discontinue all further work under the contract," and caused members of the police force to forcibly exclude the contractors from the building, thereby preventing them from finishing their work, which was nearly completed. The decision reads, "there was no evidence that at any time any of the materials furnished by the plaintiffs was not suitable, or that their work in any respect was unworkmanlike, or that they employed incompetent workmen, or that members of the labor unions were more competent than the workmen whom the plaintiffs had, or that the work was not in all respects being properly done." In a letter signed by the architects, which on Jan. 6, 1898, the mayor caused to be sent to the contractors after referring to a previous notice to suspend work, is the following paragraph:—

"You are now notified to proceed with all possible despatch to complete your work under said contract as if said notice of November 13 had not been given; but you are further notified that if any non-union men are employed by you on such work you will again be requested to dismiss them under article 3 of said contract, and that you will not be allowed to proceed to finish your work with non-union men."

Relative to this action the decision says (and all architects should take notice): "At the hearing it was admitted that this letter also was prepared in the mayor's office, and the only part which the architects had in it was to sign it at the mayor's request. The provision in said article 3, construed in view of the obvious purpose of it, and with other parts of the contract, did not, in my opinion, give the architects the power to arbitrarily order the plaintiffs to dismiss all their workmen and thus to effectually end the contract for no reason, or for the reason merely that they employed non-union men. The right reserved to the architect in that article 3 was to be exercised only for causes which pertained to the fitness or qualifications of the workmen for the performance of their work." This opinion as to the architect's control of laborers on a piece of work is

an important point for him to be familiar with and is in violation of many of the conditions of building contracts which, as a rule, architects seem to consider valid.

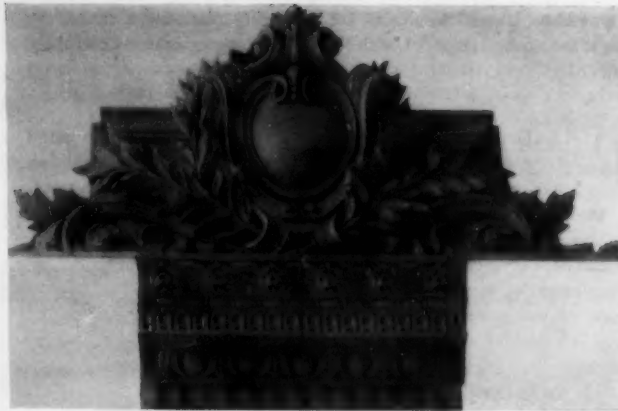
The decision then goes on to state that at the hearing the mayor claimed that he did not rely on the breach of any stipulation in the written contract for his right to take the work away from the plaintiffs, but upon the oral promise of one of the contractors to him that he would employ union men only. On this point the decision says, "Such a promise, if made, had, in my opinion, no validity, and if it was given and not kept, the plaintiffs' failure to keep it was, upon the evidence, more the fault of the defendants than the plaintiffs." Reference is then made to the fact that the plaintiffs were evidently ready to carry out the spirit of the contract if they had not been prevented from doing so by conspiracy (this referring to the refusal of union men to work on the job, with the hope of forcing the contractors to employ union men exclusively on all their work). The decision then says: "This interference by the members of the labor unions with the plaintiffs' work to force the plaintiffs to employ union men only by the means above stated, and by the use of the police to exclude the plaintiffs from the building in which their contract work was to be done, was an unlawful interference with the plaintiffs' rights, and if permitted and continued would, in the language of the Supreme Court in the discussion of a similar question, 'tend to establish a tyranny of irresponsible persons over labor and mechanical business which would be extremely injurious to both.' There is no authority in law for any officer of the government, State, or municipality to force such a discrimination as was attempted in this case between workmen in respect to the privilege of labor on public work paid for by taxes levied upon all, for no reason except that some workmen belong to a certain party, society, or class, and others do not, thus giving labor and the benefit of it to one class and denying it to another regardless of their rights, needs, qualifications, or merits, or the public welfare. Such discrimination in the employment of labor is not in accord with our ideas of equal rights, and seems not to be consistent with an impartial administering of public business, and any agreement that such discrimination shall be made is contrary to public policy, and is, in my opinion, void. The Constitution of Massachusetts declares that 'No man, nor corporation, nor association of men have any other title to obtain advantages or particular or exclusive privileges distinct from those of the community than what arises from the consideration of service rendered to the public' also that 'Government is instituted for the common good . . . not for the profit, honor, or private interest of any one man, family, or class of men.' The right of every man to labor, and the benefit of his labor according to his ability, opportunity, and desire, should not be abridged. The corresponding right of an employer to procure labor suitable for his business, subject only to such general laws as the health, safety, morality, and welfare of the community may require, should be allowed." The remainder of the decision is mainly taken up with a discussion as to the liability for damages, and the ground is taken that as the acts by which the plaintiffs were deprived of their rights were unlawful, they can recover from the defendants as individuals but not as officials. And as a matter of fact, preliminary steps have already been taken to bring suit against the mayor, the architects, and the superintendent of buildings; all of whom were concerned in the controversy. The facts in this particular case are so clearly defined, and the language of the court in the decision granting the injunction is so clear, that little comment is necessary. Probably the decision presents few, if any, new points of law, but it certainly defines with unusual clearness the merits of the case, and a careful reading of the full text of the decision, which was published in most of the daily papers of January 26, should leave little doubt as to the opinion of the Massachusetts courts, at least on the matter of undue or unlawful interference with legitimate business by labor organizations or unions; and also with regard to the right of an architect to say whom a contractor shall or shall not employ, so long as his work is in accordance with the contract and specifications.

Brick and Terra-Cotta Work In American Cities, and Manufacturers' Department.

NEW YORK. — The architects of this city have been busier for the past month putting their best work in shape for presentation at the thirteenth annual exhibition of the Architectural League than in work upon actual building undertakings, and perhaps it is just as well that the exhibition occurs during the midwinter month, when building operations are hibernating. It is very gratifying that so much interest is taken in this exhibition, not only by architects and devotees of the allied arts, but by the general public, and every member of the league feels that it is greatly to his advantage to be represented there by his very best work.

A discussion has been begun as to the advisability of holding a great exposition in New York in 1901. Assuming that an exposition would benefit New York, we agree with the *Herald* in that the date mentioned is too soon after the Paris Exposition; and merchants who spend considerable money in making a creditable showing in Paris will scarcely be willing to repeat this expenditure during the year following. If an exposition be held at all, it should be several years later. It is a question whether the New York public will care to consider an undertaking of this magnitude, when the after effects of the Columbian Exposition upon the city of Chicago are borne in mind. The suggestion of ex-Mayor Wurster, of Brooklyn, that the exposition be confined to exhibitors in the city alone, making it strictly a New York exposition, and commensurate with the size and importance of the great city, seems very sensible.

Not only New Yorkers and their immediate neighbors, but all public-spirited Americans should interest themselves in the disgrace-



TERRA-COTTA DETAIL, RESIDENCE AT CHICAGO.

Shepley, Ruten & Coolidge, Architects.
Executed by the Northwestern Terra-Cotta Co.

ful destruction of the Palisades, whose noble cliffs have sheltered the American Rhine since the days of Henry Hudson. In spite of the vigorous protests of the press, no prohibitory legislation can be secured, and day after day the destruction continues, thus bearing out the oft-repeated expression that Americans sacrifice everything for money. This month's *Cosmopolitan* contains an interesting article on the subject, with illustrations showing what a charge of three tons of dynamite effected upon one of the most beautiful spots in our fair land.

Another instance of the power of great corporations is shown in the ease with which the trolley companies of Brooklyn gained the right to run their cars over the bridge, taking up most of the space formerly used for vehicles, and crowding the bicyclists off almost entirely, although this means of locomotion to and from business has been rapidly growing in favor.

To the dissatisfaction of many, the new mayor has expressed himself as against the underground rapid transit system, and it now seems further off than ever, in spite of the unsightly appearance of the elevated roads and their accompanying nuisances and dangers.

Among new building projects are: —

A fourteen-story fire-proof building for the Tide Water Building Company, in which the Astors are interested. The building will contain offices and stores, and will cost \$850,000. George B. Post is the architect.

The Lord & Burnham Company have filed plans for an horticultural building to be built in Bronx Park, at a cost of \$200,000. The building will be constructed of brick, stone, and iron.

Architect Robert Maynicke has drawn plans for a new six-story building to be erected by the Germania Bank, on the northwest corner of Bowery and Spring Streets. Cost, \$200,000.

Mr. Solomon Loeb, of Kuhn, Loeb & Co., will erect a seven-story home and office building, which will be presented to the United Hebrew Charities. About \$150,000 will be expended.

Architects N. Le Brun & Sons have planned a five-story brick, stone, and terra-cotta building for the Marist Brothers of the Church of St. Jean Baptiste.

The Knickerbocker Realty Improvement Company will erect a twelve-story hotel on the site of the old Fourth Presbyterian Church on 34th Street, near Sixth Avenue.

Architects Babb, Cook & Willard have planned a five-story brick dwelling to be erected on Fifth Avenue, near 88th Street, for Mr. G. H. Penniman. Cost, \$65,000.

Architects Child & De Goll are preparing plans for a velodrome similar to the one in Paris, which will soon be erected in New York. The building will be devoted exclusively to bicyclists, and will cost about \$250,000.

The New York Metal Exchange will erect a ten-story fire-proof building at the corner of Pearl Street and Burling Slip.



DWELLINGS IN NEW YORK CITY.
Frank Miles Day & Bro., Architects.

Hill & Turner, architects, are preparing plans for a church for the Washington Heights Dutch Reformed Congregation. Cost, about \$125,000.

PHILADELPHIA.—Philadelphia has lately had an example of the phenomenon, probably not unknown in other localities, when a reduction in the amount of work has resulted in an increase in the number of architectural offices. Few of the usually busy architects have been able to hold their full complement of men. Some of these men have thus been tempted to begin practise with small houses or alterations to carry on, which would have been lost in the routine work of the larger offices. And just so have many of our best-known men commenced.

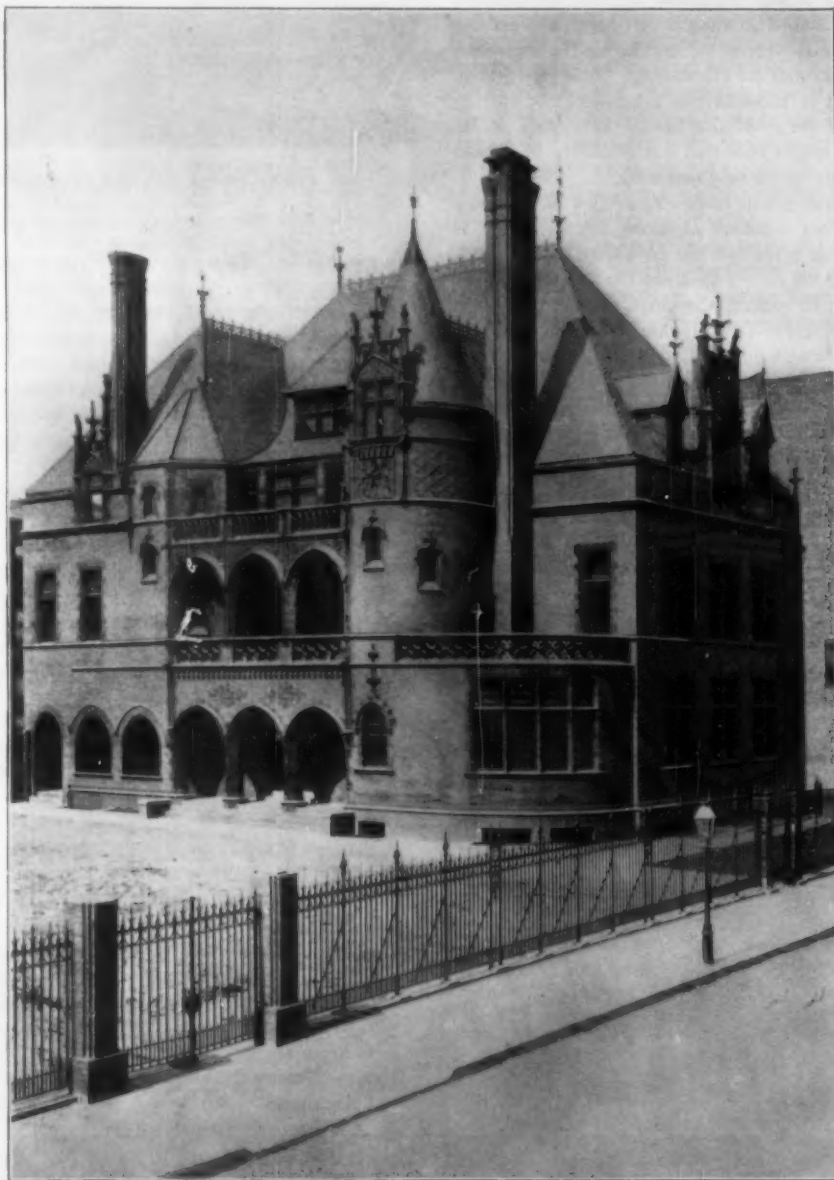
There is just finished at the Northeast corner of 4th and Chestnut Streets a most charming addition to Philadelphia architecture. A two-story bank by Wilson Eyre, Jr., built of Sayresville red brick in Flemish bond, having wide joints of cement, with white marble doorway, string-course and cornice, and slightly pitched copper roof treated so as to show already green. It all seems so natural a bit of colonial architecture that a stranger seeing it in a few years must take it for a well-preserved specimen of the old town. On the interior the colonial idea is faithfully carried out: a yellow plastered barrel vault, cut into at the sides by round-headed windows and recesses opposite, and resting on white painted pilasters with mutuled cornice; even the counters and screens are designed to correspond, in white painted wood relieved only by a few lines of mahogany molding.

The Annual Architectural Exhibition just closed, conducted by the T Square Club at the Academy of the Fine Arts, has been fully up to the average; some good English work by Colcutt, Shaw & Ernest George, and French work of the students at the Beaux Arts.

Frank Miles Day & Brother showed a rendered elevation and photographs of the lately finished brick and terra-cotta Crozer Building on Chestnut Street, above Broad. Very rich terra-cotta ornament around the tenth story and above, breaking out into pinnacled dormers around a peaked tile roof, gives the building a striking appearance from a distant point of view, for which it has evidently been designed. Cope & Stewardson were largely represented by rendered drawings of current work: Two fronts of dark red brick and light stone, on Walnut Street; the gabled entrance to a country

house in English style; also two huge renderings of buildings for the Pennsylvania School for the Blind, at Overbrook. A curious fact about the exhibition is that of the hundred and more practising architects in Philadelphia, only some twenty were represented. It is likely an effort will be made to increase this number largely in future exhibitions.

Real estate at Broad and Chestnut Streets has reached a value little dreamed of a few years ago. Already two corners have their thirteen and fifteen story office buildings, and now a third corner is to have one, this of seventeen stories. It has been designed by Edgar V. Seeler, and is to be built of granite for the first and second stories, to be occupied by the owners of the building, the Real Estate Trust Company; the upper stories of light brick and terra-cotta surmounted by a terra-cotta frieze and cornice. In planning the building considerable extra ingenuity and engineering was required, as a long, narrow strip is



ST. CHRISTOPHER'S HOUSE, NEW YORK CITY.
Barney & Chapman, Architects.
Terra-Cotta by Conkling-Armstrong Terra-Cotta Company.

to be built and finished before the remaining frontage on Chestnut Street is begun. This gives a problem of wind bracing which would have been much simplified had the whole structure gone up at once.

A twenty-story building from the plans of J. Huston is projected on Broad Street below Chestnut. Huge candelabra, carrying electric lights around the sky line, are a proposed feature of the design.

CINCINNATI.—The year 1897 has been an extremely dull one, and the records of the Building Inspector's office will show that we have done less in proportion to our population than almost any other city west of the mountains.

Up to this time it looks as though the dullness would continue during the coming year, as very little new work is talked about.



TERRA-COTTA DETAIL,
ST. CHRISTOPHER'S HOUSE,
NEW YORK CITY.

Barney & Chapman, Architects.
Executed by the Conkling-Armstrong Terra-Cotta Company.

The Cincinnati Chapter of Architects, under the aggressive leadership of its Secretary, Mr. A. W. Hayward, has awakened from its slumbers and gives promise of becoming useful to the profession and the community. They are now at work upon a revision of our building laws, and are also actively pushing a license law.

Messrs. Samuel Hannaford & Sons have just completed the drawings for the new Pearl Street Market House, and are now taking bids. This covers a space of 47 by 403 ft. It is naturally a very simple building in plan, but will be constructed of good materials, and will be quite elaborately finished with enameled and ornamental brick, with color decorations in friezes, and panels of Mosaic encaustic tile.

Messrs. Des Jardines & Hayward will remodel the old Masonic Temple, transforming it into a modern office building, at a cost of about \$100,000. This will be an interesting bit of work, and we imagine, quite a serious problem, as the old story heights and the tremendously heavy construction of the old building renders any change of existing lines rather difficult.

Next year the Golden Jubilee of the North American Saengerfest Association will be held in Cincinnati. The committee in charge of the affair will, within the month, issue a circular to the local architects, inviting competition drawings. The building will be of a temporary character, to cost about \$50,000, and the structure will be required to seat about twenty thousand persons, including audience and chorus. It is a pity that this building cannot be made a permanency, as the city needs a large hall of this character for conventions and other large gatherings.

The Cincinnati Edison Electric Light Company have entrusted the work of their new building to Messrs. Elzner & Anderson, who have about finished the drawings. This is an extremely interesting building, and is remarkable for its very heavy steel construction, as the boilers and other heavy loads are carried on the upper floors.

Outside of the work mentioned there is very little in sight. There are a few moderate-priced dwellings on the boards in several of the architects' offices, but in large office and commercial buildings we are woefully lacking.

ST. LOUIS.—The outlook for the coming year is far from being as encouraging as was hoped for. Usually, anticipated work is well under consideration by this time, but there has been little activity in that direction up to the present. The conservative investor has not loosened his purse strings sufficiently to cause much of a ripple in building circles, although there is some satisfaction to be gotten from the report of the Building Commissioner for January, which shows continued improvement in the class of buildings being built.

The past year has the most notable fire record of any in the history of the city. Early in the year the Lionberger Building, a noble work by Richardson, was destroyed, which, with its contents, amounted to a million and a quarter dollar loss; while later the old landmark, the Polytechnic Building, met a similar fate. During the closing month of the year the F. O. Sawyer Paper Company's building, and the Mermod, Jaccard Building were burned. The latter fire occurred on December 19, totally destroying the building, which was occupied as a jewelry store by the above-named firm. The enterprise shown by the firm, which is one of the largest of its kind in the West, was at least unusual, they having by the following morning purchased the entire stock of another firm, and opened for business without an hour's loss of time, the fire being on Sunday morning.

The new year also gives promise of a fire record. On January 8 a portion of the Christian Peper Tobacco Company's warehouse was consumed, entailing a loss of \$125,000. The building was six stories, of heavy timber construction. Brick walls divided the building and confined the fire to the one wing. Each of these burned



TERRA-COTTA DETAIL,
ST. CHRISTOPHER'S HOUSE,
NEW YORK CITY.

Barney & Chapman, Architects.
Executed by the Conkling-Armstrong Terra-Cotta Company.

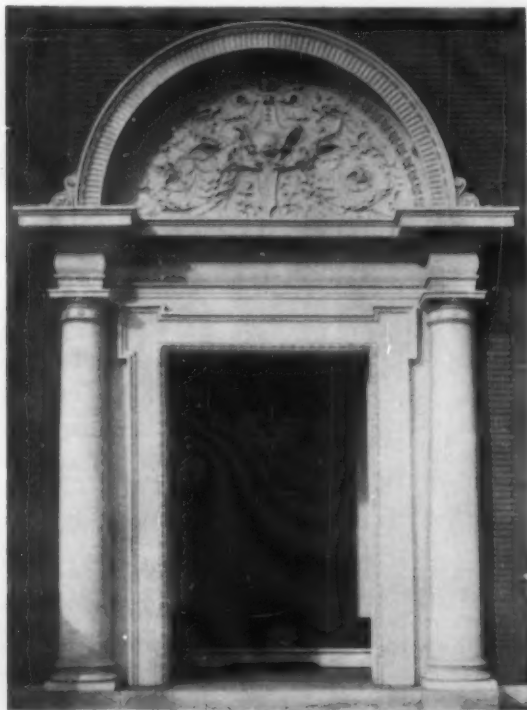
buildings form an interesting study, fully illustrating the necessity of more thorough inspection of buildings and stricter enforcing of the building ordinance.

On January 26 the Union Elevator was burned, causing a loss of \$750,000. This was located on the other side of the river, but was a St. Louis enterprise.



HOUSE AT ST. LOUIS.
Barnett, Haynes & Barnett, Architects.
Terra-Cotta executed by the Winkle Terra-Cotta Company. Front Brick furnished by the Hydraulic-Press
Brick Company.

St. Xavier's Church, on the corner of Grand and Lindell Streets, has been completed with the exception of the tower, and was dedi-



DETAIL OF ENTRANCE, HOUSE AT ST. LOUIS.
Barnett, Haynes & Barnett, Architects.

cated on Sunday, January 16. The building is 212 ft. long by 120 ft. wide, and 66 ft. high in the center of nave. The ceilings are groined, springing from highly polished marble columns. The style is the early English, and it was designed by the late Thomas Walsh, who commenced the building in 1883. Later the plans were revised by Henry Switzer, who had charge of the work until its completion.

The bells which will be placed in the tower when it is completed have a considerable historical interest, having been cast in Spain in 1761. On the night of July 25, 1812, the bells were broken by a shell

thrown by the French from the Trocadero, and were later recast.

Within the last few months St. Louis has lost one of her most prominent firms of architects, Wheeler & McClure having gone to New York.

A movement has been inaugurated by the labor organizations to have an exposition here in 1903, in commemoration of the hundredth anniversary of the Louisiana Purchase.

The Master Builders' Exchange closed their year's work on December 27, with a banquet and the installation of the following officers for the ensuing year:—

President, L. J. Evans; First Vice-President, J. D. FitzGibbons; Second Vice-President, George Ittner; Secretary, C. D. Morley; Treasurer, Adam Baurer; Trustees, Jas. H. Bright and C. Linnenkohl.

At the annual meeting of the St. Louis Architectural Club, on January 8, Mr. Wm. B. Ittner was re-elected President; F. A. P. Burford, First Vice President; H. G. Eastman, Second Vice President; Emile Neiman, Secretary; J. C. Stephens, Treasurer; R. G. Milligan and Benno Jansen, Executive Board.

CHICAGO.—Mention has been previously made of the Illinois State law entitled, "an act to provide for the licensing of architects and regulating the practise of architecture as a profession." Subsequent to Jan. 1, 1898, an architect obtained a license only by passing an examination, or making an "exhibition" to the Board of Examiners, which was considered by them an equivalent.

The first grant of licenses to architects who were not practising when the law was passed resulted in qualifying twelve on examination (one of whom was a woman,) and six on exhibition of their work.



NEW SYNAGOGUE AT TORONTO, ONT.
J. W. Siddall, Architect.

Only one was rejected. It is of interest to note that the man ranking first in this examination had had six years' experience with a contractor, but no technical training aside from that gained in an architect's office. The second in rank, on the contrary, had had an exceptionally extensive education. The woman was the third in rank, and she included in her experience a course at the Boston Institute of Technology, and travel abroad. Some of those ranking lowest had had four years' training in architectural schools.

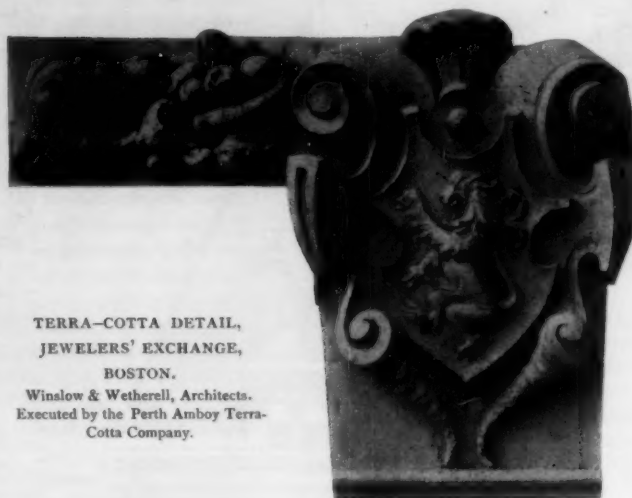
The Chicago building ordinances are undergoing revision, although nothing radical is contemplated. Joseph Downey, contractor and ex-commissioner of public works, is chairman of the revision committee, which includes in its membership real estate and material men, a representative of the Building and Trades Council, and Mr. Shankland, the engineering member of the firm of D. H. Burnham & Co.

Amongst the work of interest announced this month are noted a Jewish synagogue of brick, designed by Mr. Paul Gerhardt; a brick and terra-cotta high school building, by N. S. Patton; alterations to an office building at Lake and La Salle Streets, by D. H. Burnham & Co.; an apartment building by architect Eisendrath; and some important fire-proof manufacturing buildings, by Mr. Fritz Foltz.

Jenney & Mundie are nearly ready to let contracts on the addition to the New York Life Building. Two stories of this structure will be granite, but the other ten stories will be terra-cotta. The floor and partition construction will be hollow tile.

A NEW FORM OF ENAMEL TILING.

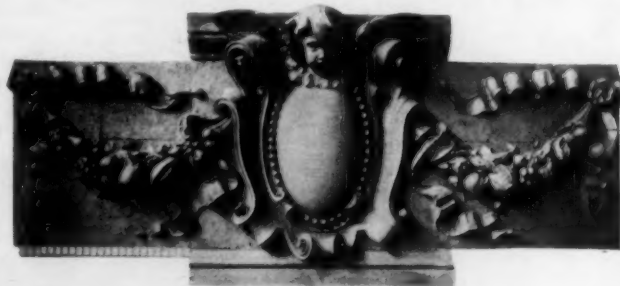
THE catalogue of the American Enamel Brick and Tile Company presents, in addition to the ordinary shapes, a form of enamel tiling intended to replace enamel bricks where economy of space and freight charges is necessary. The bricks or tiles are all grooved along the top and bottom edges, the walls of the upper grooving being of even length, while the inner wall of the lower groove is shallower than the outer one. This allows the outer joints to be laid close, at the same time leaving space enough between the outer walls for a nail, which can be driven at any point within the length of the tile, whether the same crosses a horizontal or a vertical joint of the wall behind. In applying these tiles to an upright wall or backing they are built on each other from the bot-



TERRA-COTTA DETAIL,
JEWELERS' EXCHANGE,
BOSTON.
Winslow & Wetherell, Architects.
Executed by the Perth Amboy Terra-Cotta Company.

The tiles are made to lay as standard English size brick, namely, 3 in. by 9 in. face, and are made 2 ins. thick. Where economy of space is an object this tile is an excellent device, and for wainscoting of lavatories in wooden houses, where brick nogging is not desired or impracticable, this tile can readily be put in place with combined economy and absolute surety against falling out after the work is finished. Corners and quoins, rebated vertically to fit into the tiles, are

manufactured to go with this facing, together with special moldings for top of wainscoting fastened in similar manner.



TERRA-COTTA DETAIL, CONVERSE BUILDING, BOSTON.
Winslow & Wetherell, Architects.
Executed by the Excelsior Terra-Cotta Company.

tom or lower part of the wall or backing upward, and as each course is laid the several tiles in the course are nailed to the wall or backing by one or more headed nails, the heads of the nails overlapping the interior of the inner wall of the groove. In bedding the tile the cement seizes the nail and fills the groove, bonding all together into the wall. Screws or shorter nails can be used where these tiles are set as linings over wooden partitions, also economizing materially in space, and, owing to the secure bond between the tiles effected by the cement tongue in the middle groove, it is not necessary to nail each individual tile.

NATIONAL BRICKMAKERS' CONVENTION.

THE twelfth annual convention of the National Brick Manufacturers' Association was held at Pittsburgh, Pa., Tuesday to Friday, February 15 to 18. It was one of the most successful conventions ever held by the association. These annual gatherings, which are attended by many of the larger clay workers of the country, are productive of a distinct betterment of the burnt-clay industries as a whole. Not only do the workers freely discuss the more important problems connected with the business, but the greater part of the time is given over to the reading of important papers of a technical nature, which are prepared by those well versed in the art of clay working. We doubt if there is another industry in this country where the people interested give more thought and careful attention to the end that their product shall meet the requirements of an exacting market.

CURRENT ITEMS OF INTEREST.

THE Fawcett Ventilated Fire-proof Building Company, James D. Lazell, Boston agent, have completed a vault floor for the Five-Cent Savings Bank, Boston.



TERRA-COTTA DETAIL, CONVERSE BUILDING, BOSTON.
Winslow & Wetherell, Architects.
Executed by the Excelsior Terra-Cotta Company.

THE AMERICAN ENAMELED BRICK AND TILE COMPANY, of New York, have appointed W. G. Weaver, 22 Clinton St., Newark, N. J., their sales agent for the State of New Jersey.

WALDO BROTHERS have secured the contract for furnishing the glazed tiles for walls of Adams Square Station of Subway, Boston. The tiles will be manufactured by the Atwood Faience Company.

GROSS & HORN, 506 West Broadway, New York, have been appointed agents for Samuel H. French & Co., manufacturers of Peerless Mortar Colors, who report a rapidly increasing demand for their product.

THE Brick, Terra-Cotta, and Supply Company, of Corning, N. Y., are furnishing the architectural terra-cotta required for the 119th Street, 89th Street, and 20th Street schools, New York City; C. B. J. Snyder, architect.

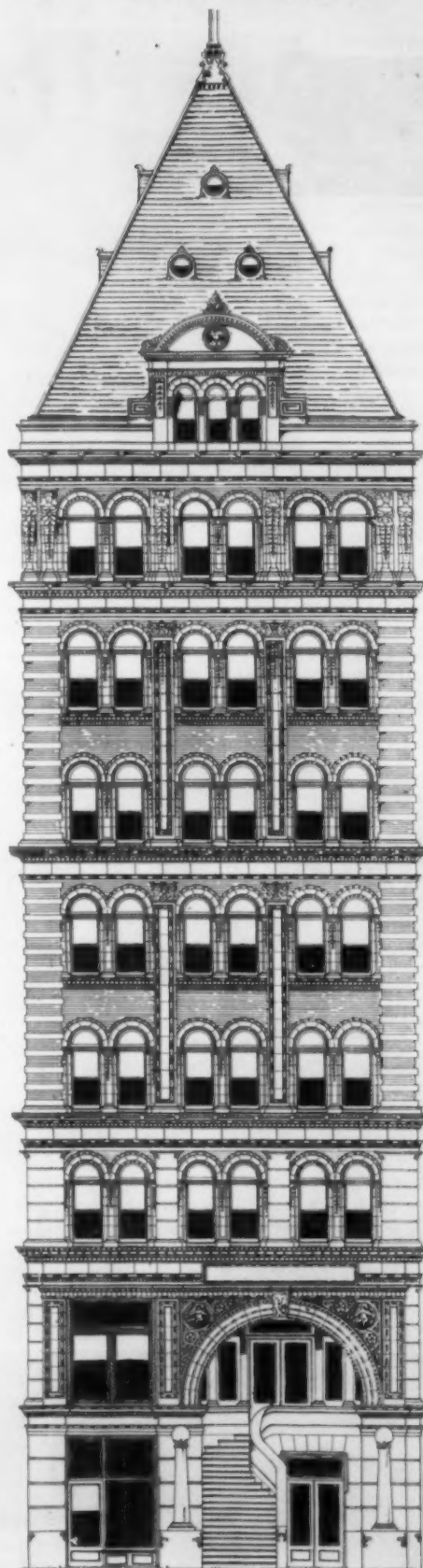
THE Burlington Architectural Terra-Cotta Company are supplying terra-cotta for the new shoe factory being built at Burlington, N. J.; also for a residence at Germantown, Pa., of which H. E. Flower is the architect.

THE name of the Akron Hydraulic-Press Brick Company, of Cleveland, O., has been changed to the Cleveland Hydraulic-Press Brick Company. The management of the company is in no way changed, it being a branch of the Hydraulic-Press Brick Company of St. Louis.

THE Wallace Manufacturing Company, at Frankfort, Ind., have sold since Jan. 1, 1898, nine of their Wonder Brick-making Machines. This is pretty good evidence of two things,—increasing business among the brickmakers, and the popularity of this particular make of a machine.

THE Mason Safety Sidewalk Light is attracting the attention of architects very generally. A good example of its use is shown in front of the Oriental Tea Company, on Court Street, Boston. It has a perfectly level, non-slipping surface, a great desideratum in wet or frosty weather. Its lighting capacity is very large.

PRECIPITATED CARBONATE OF BARYTES, a preventative for scum and discoloration, neutralizing the sulphate of lime in the clay and water, finds a ready demand among those who investigate its merits. Gabriel & Schall, importers, 205



PROPOSED BACHELOR APARTMENT HOTEL,
NEW YORK CITY.
Franklin D. Pagan, Architect.

Pearl Street, New York, report a most gratifying growth of this part of their business.

CHARLES E. WILLARD, 171 Devonshire St., Boston, has recently closed the contracts for 150,000 Standard and Norman sized brick for the new building now being erected by the Boston Wharf Company, Boston; M. D. Safford, architect; and 150,000 white brick for the Westminster Chambers, Copley Square, Boston; H. E. Creiger, architect.

THE BERLIN IRON BRIDGE COMPANY, of East Berlin, Conn., have closed the following new contracts: Steel roof for the Boston Gas Light Company's new building; steel framework, new power house for the American Coffee Company, at Brooklyn; furnishing and erecting a new building, to be known as the Tower Building, for the Benjamin Atha & Illingworth Company, at Harrison, N. J.

THE COLUMBUS BRICK AND TERRA-COTTA COMPANY have supplied their brick on the following new work: Bank building, Columbus, Ohio; L. L. Rankin, architect; residence for W. M. Taylor, Columbus; Yost & Packard, architects; Spahr-Glenn office building, Columbus; D. H. Burnham & Co., architects; Citizens' National Bank Building, Charleston, W. Va.; Yost & Packard, architects; Police Station at Detroit, Mich.; Louis Kamper, architect.

THE C. P. Merwin Brick Company, Berlin, Conn., report the following buildings lately completed, in which their hollow brick were used: Insane ward Connecticut State Prison, First National Bank, Police Station, and Brown Street School, all in Hartford, Conn. They are also furnishing hollow brick for Lowell Block, Worcester, Mass., Cutting, Bardwell & Co., contractors; and both hollow and pallet brick for St. Patrick's Church, Whitinsville, Mass., Chas. D. Maginnis, architect; H. P. Cumming & Co., contractors.

G. R. TWICHELL & Co., 19 Federal St., Boston, report the following recent sales: 150,000 enameled brick for the new building now being erected at South Boston for the Boston Electric Light Company; a large quantity of Ridgway gray Roman brick and Massachusetts wire-cut red brick for the same structure; buff brick for an apartment house at Hartford, Conn.; chocolate-colored brick for a front on Bay State Road, Boston; buff brick for eight new apartment houses at Brookline, Mass.; and a large number of brick for fireplaces for a dormitory at Harvard College.

THE regular annual gathering of general managers of the various branches of the Hydraulic-Press Brick Company was held, as usual, in St. Louis early in February.

The Hydraulic-Press Brick Company, of St. Louis, find it both interesting and profitable to entertain all their general managers once a year; when thus assembled, some twenty or more practical men of experience in the business discuss and advise with each other concerning the various difficult problems connected with modern methods of brickmaking. As these gentlemen represent various plants scattered through nine States of the Union, and producing annually over three hundred million of bricks in endless variety of colors from many different clays, they are each able to furnish valuable suggestions from their various experiences under widely varying conditions. The care, energy, and ability devoted by these gentlemen to the problem of producing at the least cost the high grade of bricks required by modern standards is apparent in the product resulting from their efforts, which may be seen in their exhibit rooms in St. Louis, Kansas City, Omaha, Chicago, Minneapolis, Cleveland, Rochester, Pittsburgh, Baltimore, Washington, Philadelphia, New York, and Boston. They are prepared to offer in any section of the country all the various shades of color in bricks, made from the different varieties of clay throughout the United States.

These meetings, continuing through several days, afford an opportunity for pleasant social intercourse and much pleasant companionship between the gentlemen in charge of the various branches of this widely extended manufacturing business.

A PARTY HAVING SEVERAL YEARS' EXPERIENCE IN SELLING BUILDING SUPPLIES IN NEW ENGLAND, AND WITH AN EXTENSIVE ACQUAINTANCE AMONG THE ARCHITECTS AND CONTRACTORS IN THE NEW ENGLAND TERRITORY, DESIRES TO CONNECT HIMSELF WITH SOME CONCERN DEALING IN GENERAL BUILDING MATERIALS.

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Dried Linseed Oil

is permeable to moisture and gases. No linseed oil paint will perfectly protect iron and steel from rust. If you use

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on structural Iron Work it forms an air-tight skin and affords absolute protection. "Application of Paints" will be sent on request. Gives facts worth knowing.

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A modest but very attractive design for a simple Fireplace Mantel, made of Ornamental Brick. It gives a large return for a small outlay, the price in red brick being only

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Our mantels are the newest and best in every way. Our customers say so. They don't cost any more than other kinds, and can be easily set by local brickmasons. Don't order a mantel before you have learned all about ours. The above is only one of our many designs. Send for our Sketch Book of 53 mantels costing from \$10 up. It tells all about these charming mantels.

Phila. & Boston Face Brick Co., 15 Liberty Square, Boston, Mass.

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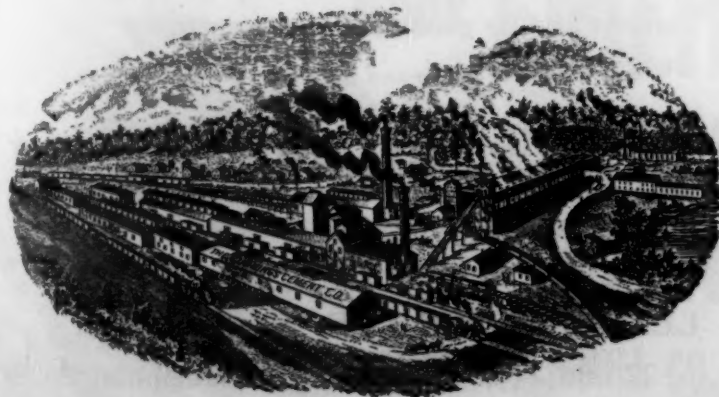
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YOU WANT A COLOR THAT IS FINE, AND STRONG, AND EVEN,
AND WORTH YOUR MONEY—A COLOR THAT IS CLINTON.

WE MAKE IT, AND WE ARE THE ONLY ONES WHO DO, IN SPITE OF
THE CLAIMS OF THOSE WHO FLATTER US BY TRYING TO IMITATE
OUR BRANDS. ISN'T THIS WORTH REMEMBERING?

CLINTON METALLIC PAINT CO.,
CLINTON, N. Y.



MANHATTAN CONCRETE COMPANY,

Incorporated under the Laws of the State of New York.

Concrete.

Capital Stock, \$50,000.

High Grade Work of Every Description.

ROSS F. TUCKER, President and Manager,

Room 923, 156 FIFTH AVENUE, NEW YORK.

Berry & Ferguson,

New England Agents for

Snyder's "Crescent" Brand Rosendale Cement,
"Burham" English Portland Cement,
"Lafarge" French Portland Cement,
"Germania" German Portland Cement,
"Globe" Belgian Portland Cement.

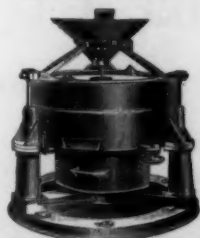
Also dealers in

General Masons' Supplies.

Removed to

102 STATE STREET, BOSTON.

EMERY MILL.



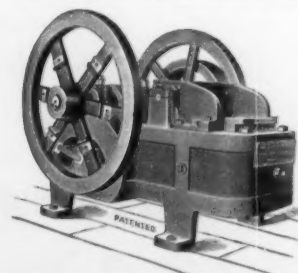
Will finish 20 bbls. of common
cement per hour, 5 to 6 bbls.
of Portland per hour.

Emery Stones made to fit any
mill frame.

ROCK EMERY MILLS, MILLSTONES, and CRUSHERS for CEMENT

STURTEVANT MILL CO., - - Boston, Mass.

ROLL JAW FINE CRUSHER.



Breaks large or, when set close,
reduces to gravel and sand
at one operation.

EXAMPLES OF BOND.

(Continued.)



Random rubble, no spalls on the face.



Five-point random rubble, no spalls on the face.

GILBRETH SEAM-FACE GRANITE CO.,

85 Water Street,
Boston.160 Fifth Avenue,
New York.

When You Write

Plumbing Specifications

call for

"Brown Bros'. Seamless Drawn Copper Range Boiler"

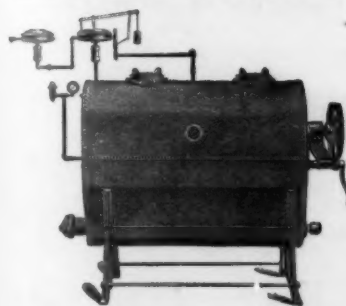
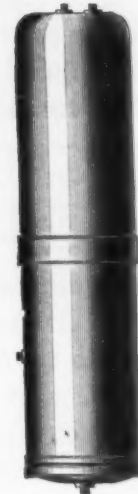
and you will get the best house range boiler obtainable. Do not add the words "or equal," for they have no equal. There are neither rivets to loosen nor brazed seams; hence no leaks. Thoroughly tinned on inside and guaranteed to stand a working pressure of 150 lbs. Extra heavy guaranteed to 200 lbs. Guaranteed not to collapse.

Booklet for the Asking.

RANDOLPH & CLOWES,

Sole Manufacturers,

Box 15, Waterbury, Conn.



Napheys Acetylene Gas Generators

for lighting buildings of any description. **Safe, convenient, and economical.**

A great saving in cost with vastly superior quality of light. Every builder, architect, plumber, and real estate dealer should inform himself regarding this most valuable light. Correspondence solicited.

J. B. COLT & CO., Dept. S,

..Manufacturers.. **Magic Lanterns, Slides, and Accessories.**

Offices, 115-117 NASSAU ST., NEW YORK.

ACETYLENE GAS SHOW ROOMS,

125 West 37th Street, cor. Broadway, New York.

CHICAGO.

SAN FRANCISCO.

Mention this publication.

Muresco!

It is a permanently hard wall finish. Over plaster it produces soft, even tints, giving the effect of kalsomine, but with none of its disadvantages. It does not rub off against the clothing; will not crack nor peel. It will kill suction, and gives a smooth, even coat over an old plastered wall that has been patched. It comes in fifteen artistic colors and white.

You may have a color card and full information about **MURESCO**, for the asking.

BENJAMIN MOORE & CO.,

Brooklyn,

NEW YORK.

257 Water St.

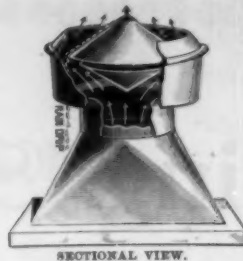
WATERPROOFING BRICKS.

To those who are tired of applying two or three coats of linseed oil to their brick walls every two or three years, and to those who would like to avoid the expense which this triennial application entails,

CABOT'S BRICK PRESERVATIVE

is recommended as an article that will waterproof brickwork thoroughly with one coat (or with the most porous bricks, two coats,) at a less cost per coat than oil, and which the test of time has proved to be permanent. It is an indestructible, insoluble compound which never requires renewal. A preventive of the white efflorescence.

SAMUEL CABOT, Sole Manufacturer,
70 Kilby Street, Boston, Mass.



The

"Pancoast" Ventilator,

THE ONLY VENTILATOR TO USE IN VENTILATING

Schools, Churches, Mills, and Factories,

BREWERIES, DISTILLERIES, MALT HOUSES.

A VENTILATOR THAT WILL VENTILATE.

The Pancoast Ventilator Co.

(Incorporated)

Main Office, 316 Bourse Bldg., PHILADELPHIA.

Made in all Sizes.

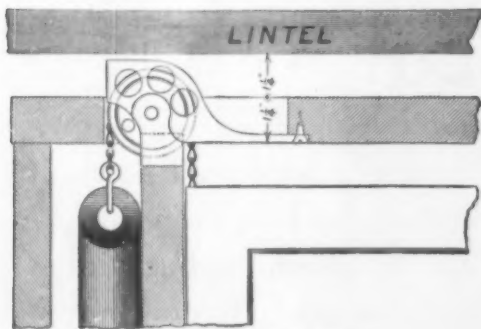
From 2 inches to 10 feet.

Guaranteed to give
Satisfaction.

The Best Ventilator for the
Least Money.



THE "QUEEN" SINGLE FRAME PULLEY.



PATENTED SEPT. 21, 1897.

The above cut shows a 2 1/2 inch Pulley.

QUEEN PULLEYS.

Patented Sept. 21, 1897.

No Extra Head Room Needed.

No Grooving of Sashes.

No Lead Weights.

Architects will note accompanying cuts. They represent a 2 1/2 inch pulley that only requires 2 1/4 inches head room from top of sash. Used in most difficult work.

Send for Catalogue and Price-List.

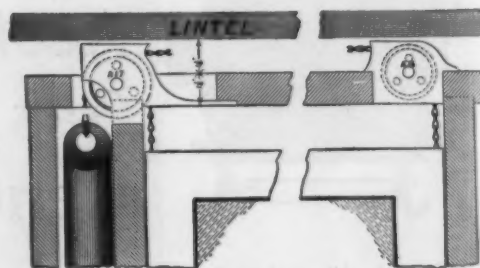
Queen Sash Balance Co.,

150 Nassau St., New York City.

Chicago, Boston, Philadelphia, Baltimore, St. Louis, Washington, Worcester.

THE "QUEEN" MULLION FRAME PULLEYS.

One weight balances the Sash.



PATENTED.

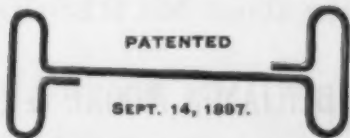
The above cut shows a 2 1/2 inch Pulley.

The Cleveland Patent Steel Wall Ties,

FOR

BONDING FACE BRICK,
HOLLOW WALLS, ETC...

Perfectly
Flat.



MANUFACTURED EXCLUSIVELY BY

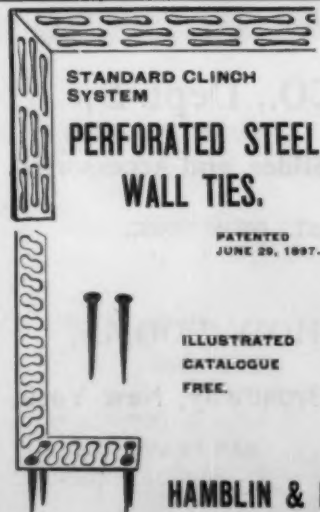
THE CLEVELAND WIRE SPRING COMPANY,

Wason, Hamilton, and Dart Sts.,

CLEVELAND, OHIO.

JOHN WALES CO., Boston, Mass., New England Agents.

Galvanized
or Japanned.



STANDARD CLINCH
SYSTEM

PERFORATED STEEL
WALL TIES.

PATENTED
JUNE 20, 1897.

ILLUSTRATED
CATALOGUE
FREE.

"BRACE" SNOW

GUARD.



SEE
THAT
BRACE?

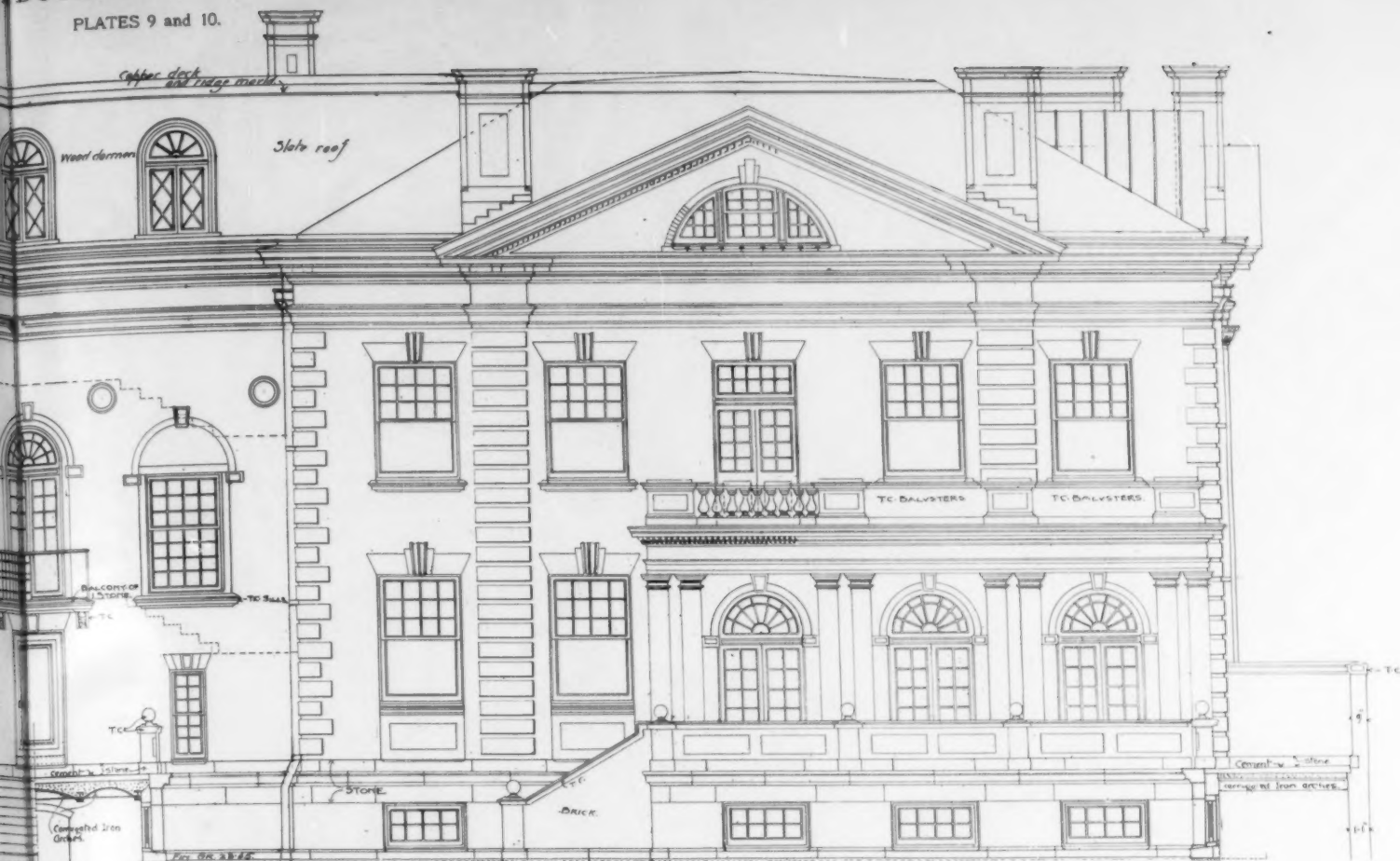
HAMBLIN & RUSSELL MANFG. CO., Worcester, Mass.



ADMINISTRATION BUILDING, CHICAGO ORPHAN ASYLUM
SHEPLEY, RUTAN & WELCH

BUILDER.

PLATES 9 and 10.

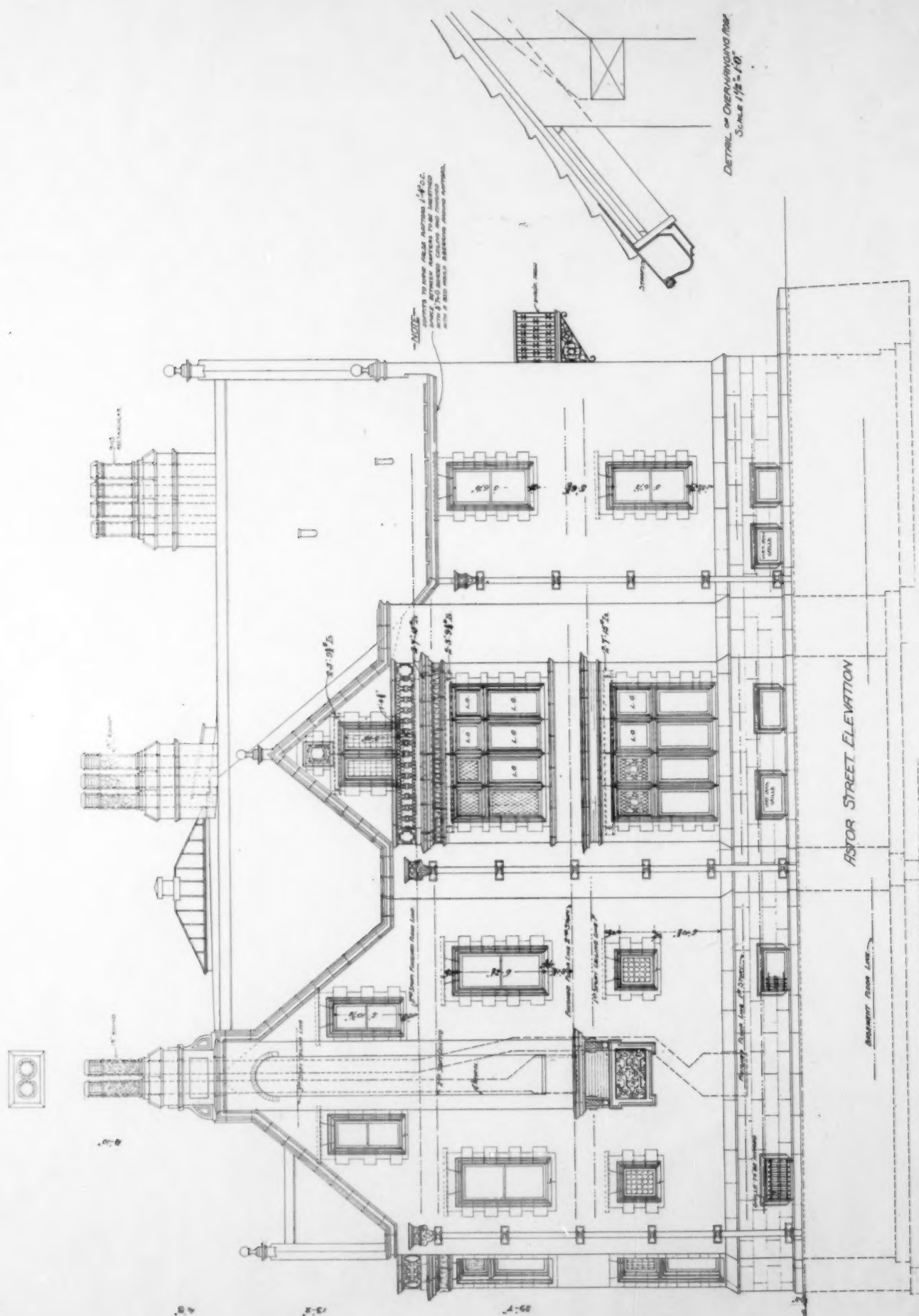


CHICAGO ORPHAN ASYLUM, CHICAGO, ILL.

TAN & WILGIE, ARCHITECTS.

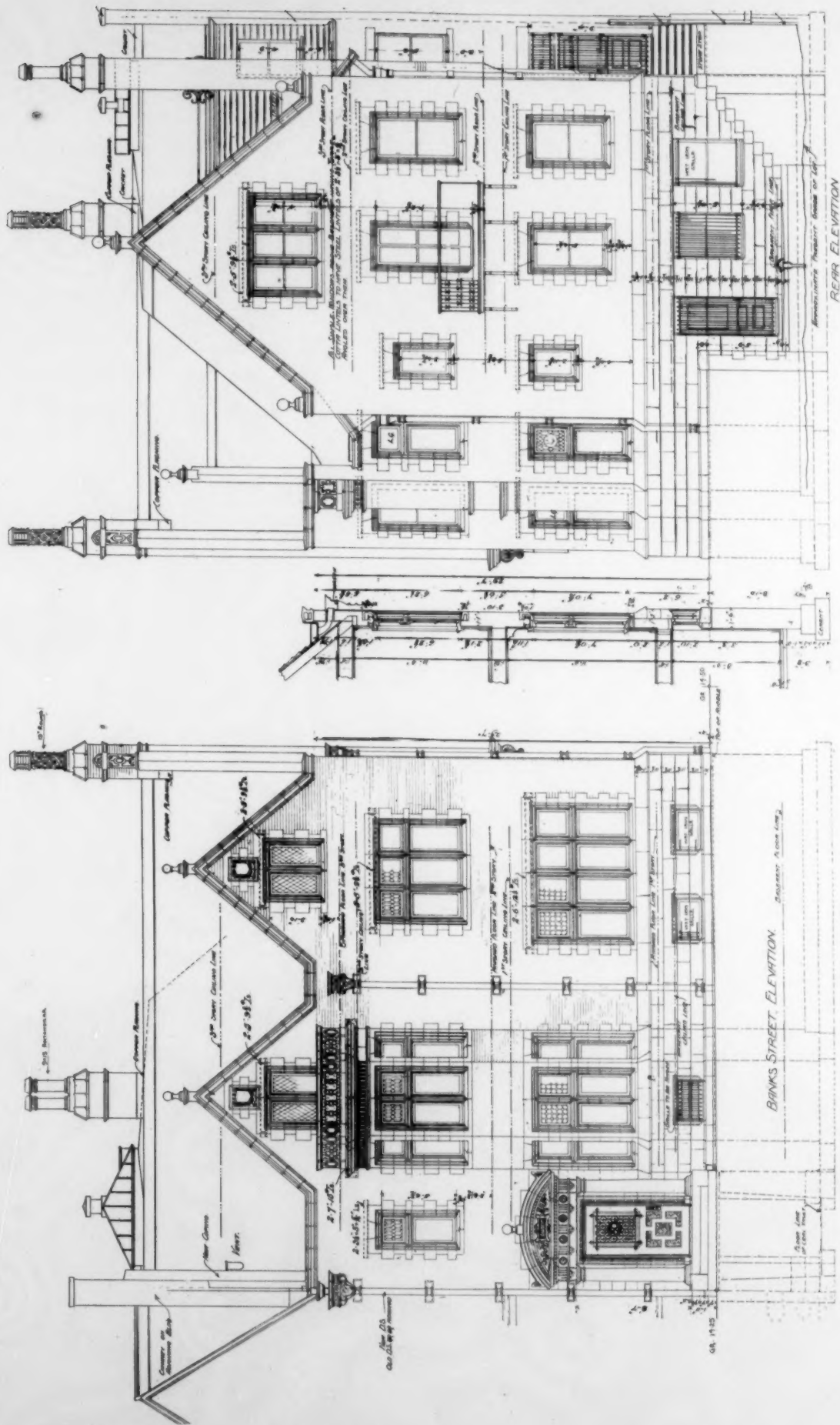
U of M

PLATE 11.



HOUSE AT CHICAGO, ILL.

SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS.

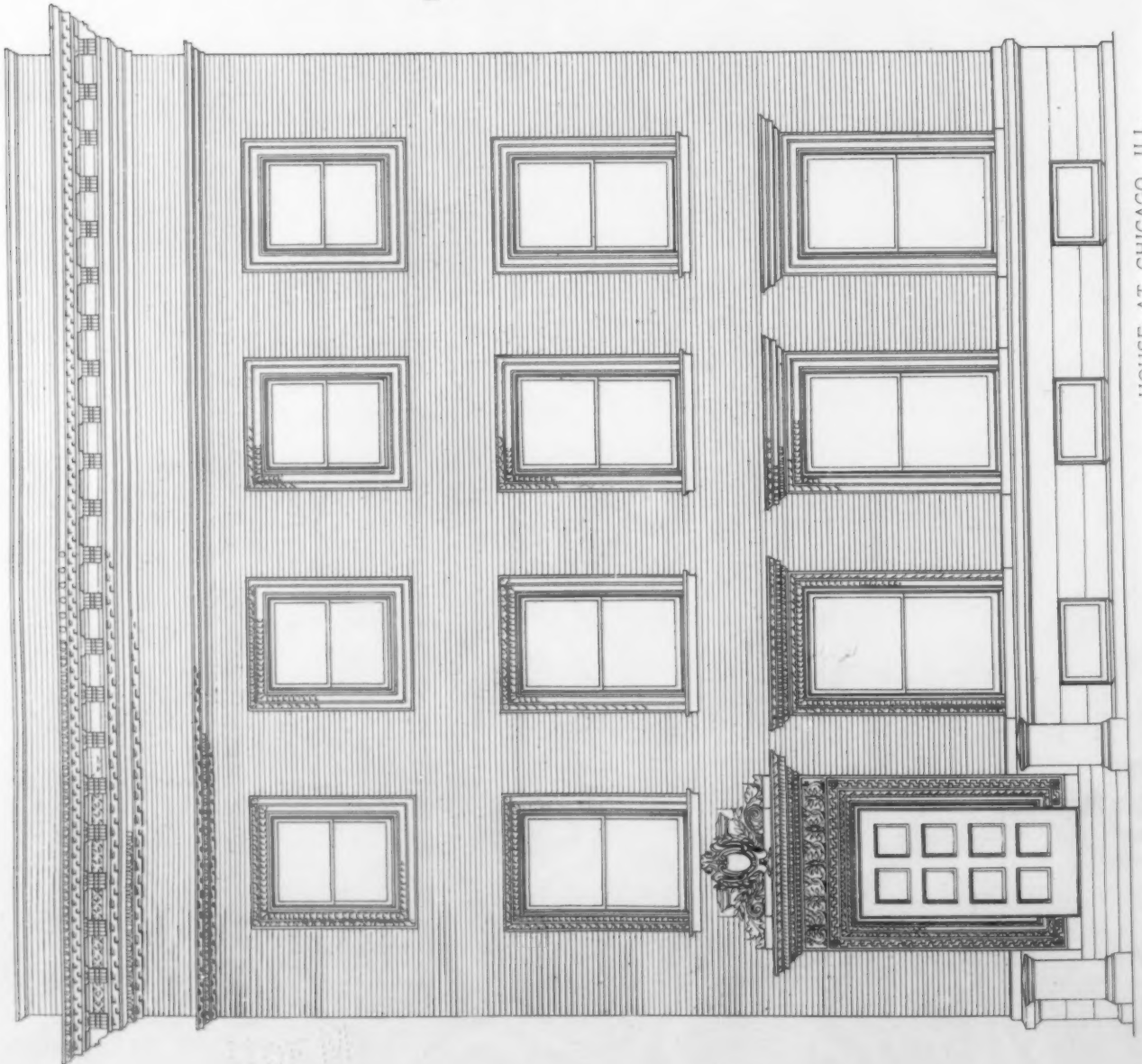
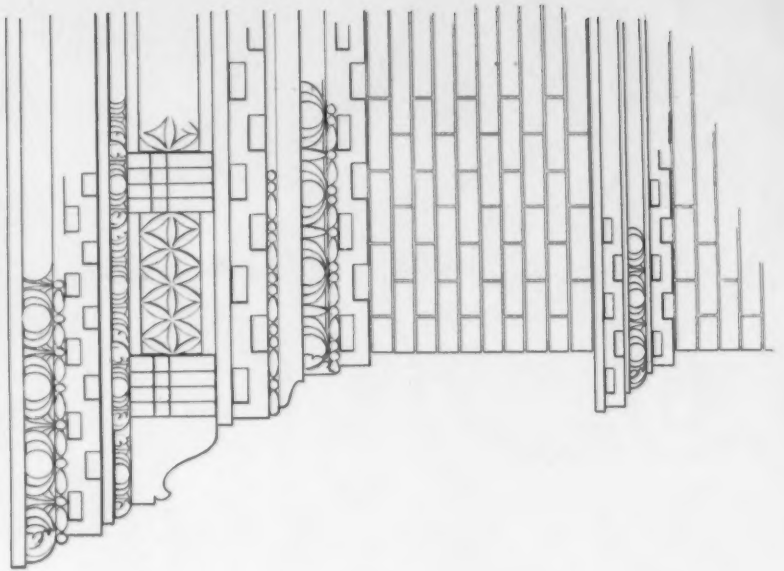
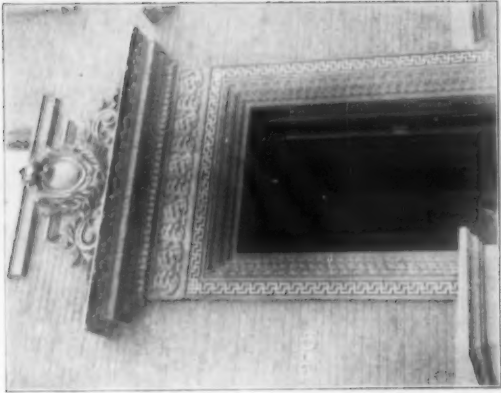


HOUSE AT CHICAGO, ILL.
SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS.

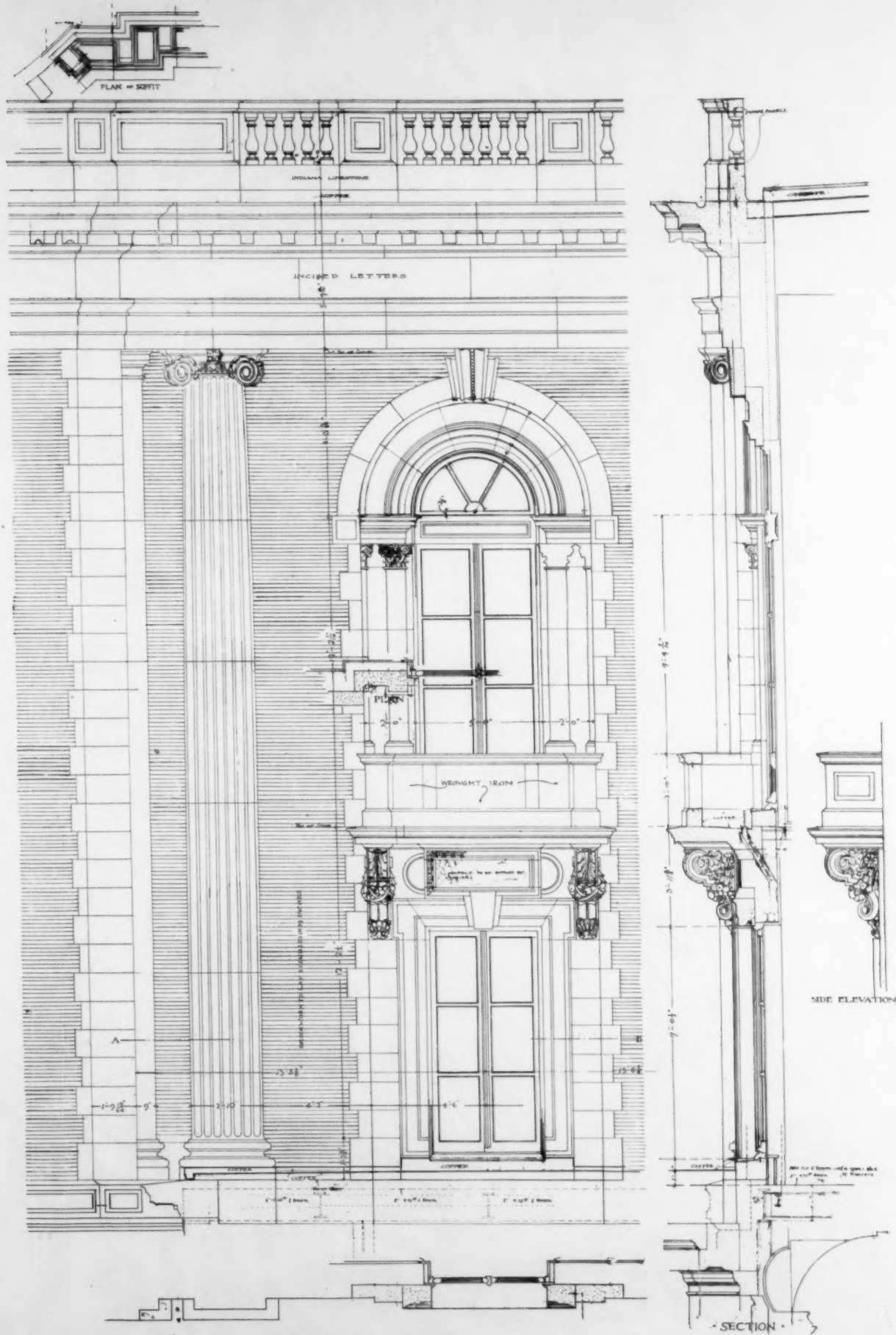
THE BRICKBUILDER.

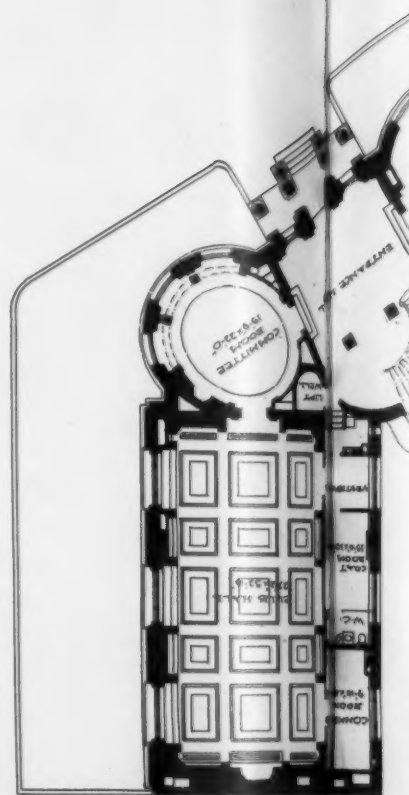
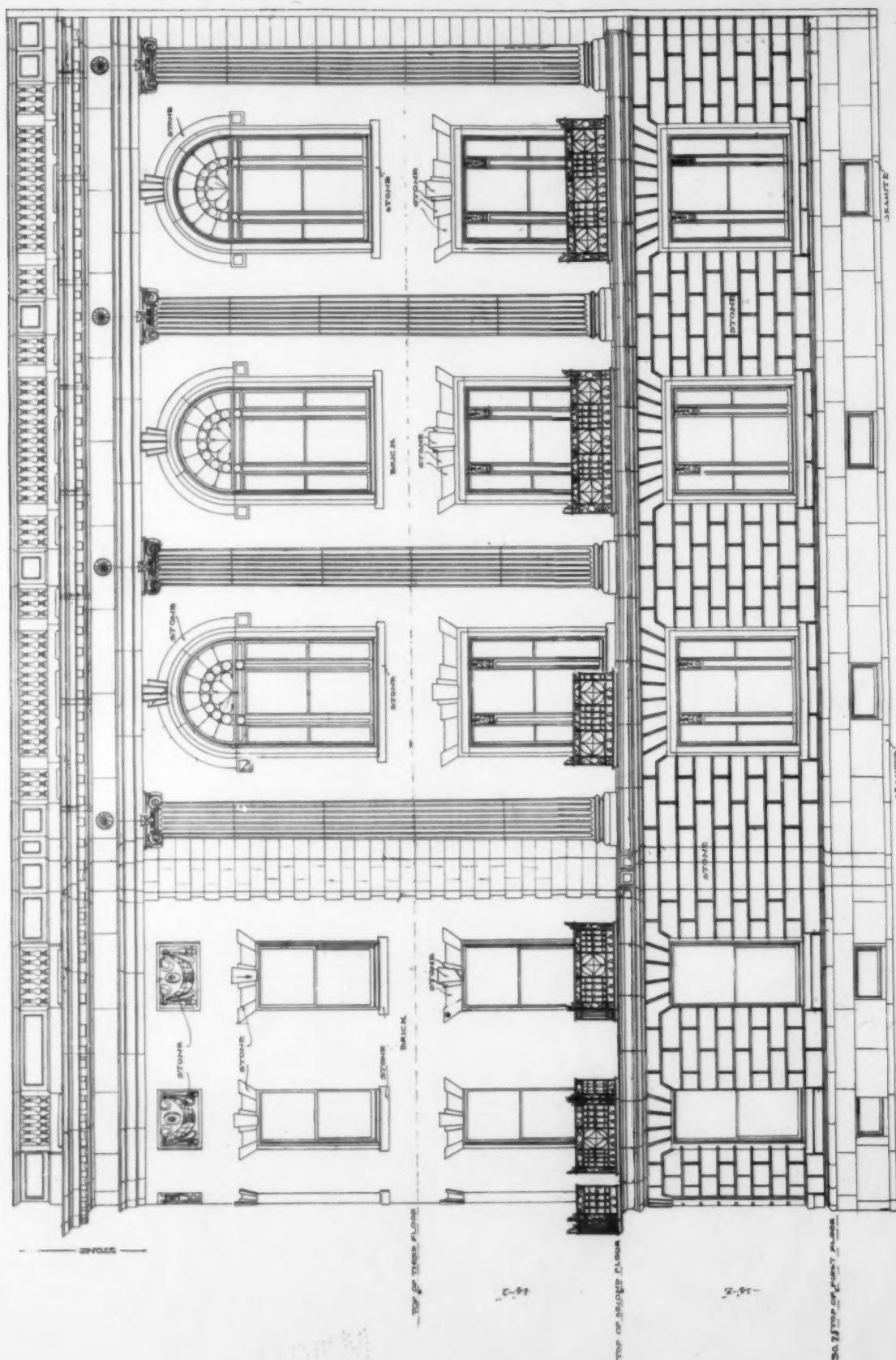
VOL. 7. NO. 2.

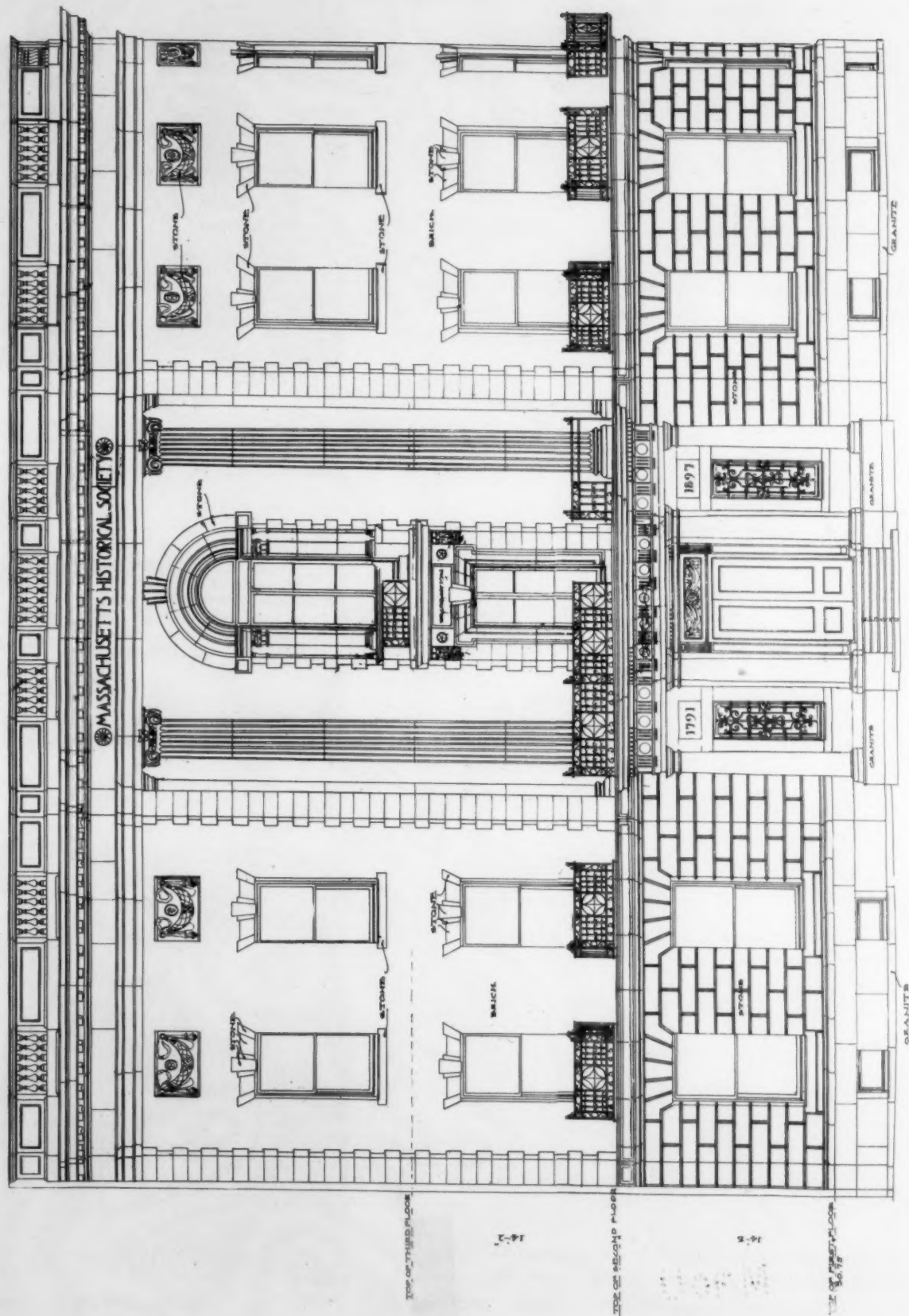
PLATE 13.



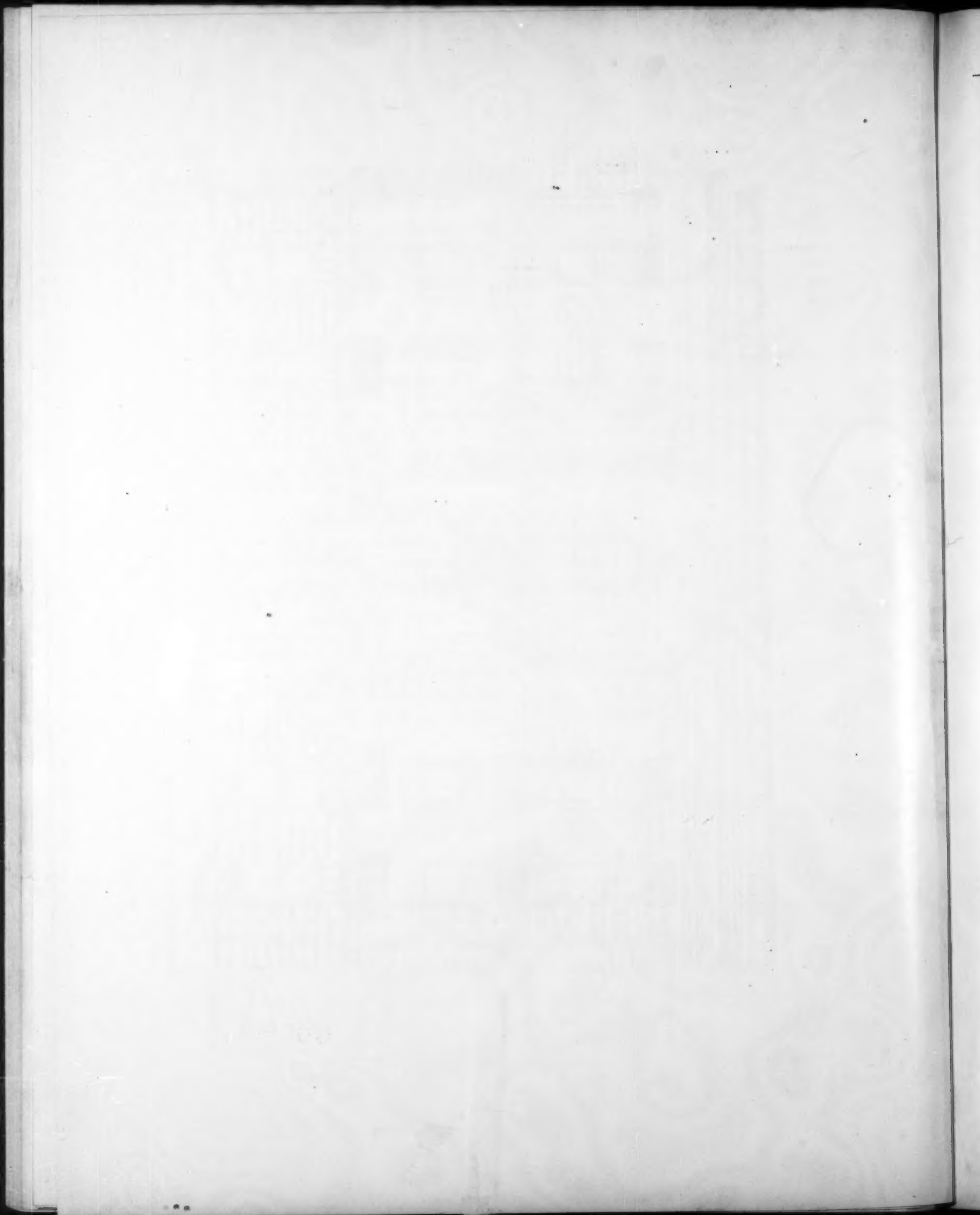
HOUSE AT CHICAGO, ILL.
SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS







FRONT ELEVATION.
BUILDING FOR THE MASSACHUSETTS HISTORICAL SOCIETY, BOSTON, MASS.
WHEELWRIGHT & HAVEN, ARCHTTS.





RESIDENCE OF W. D. HOLLIS CHICAGO.



HULL MEMORIAL CHAPEL, CHICAGO.



RESIDENCE OF LEON MANDEL, CHICAGO.

The Celadon Terra-Cotta Co., Ltd.

CHARLES T. HARRIS, LESSEE.

....Manufacturer of....

Artistic Roofing Tiles.

ALFRED, N. Y.

This cut illustrates the use of our 8 in. Conosera tile and the graduated tower tile; also our terra-cotta hip and ridge roll and finials. See November and January numbers of THE BRICKBUILDER.

EASTERN OFFICE:

Suite 1123-4 Presbyterian Building,

156 FIFTH AVENUE,

NEW YORK.

This cut illustrates the use of our closed-shingle, as described in the December number of THE BRICKBUILDER.

WESTERN OFFICE:

Suite 1001-2 Marquette Building,

204 DEARBORN STREET,

CHICAGO.

This cut illustrates the use of our open-shingle tile, which is of the same character as the closed-shingle, only made with a lip, and laid 200 to the square open, instead of 300 to the square closed.

Boston Representative, CHARLES BACON, 3 Hamilton Place.



THE ASTORIA HOTEL, FIFTH AVENUE AND THIRTY-FOURTH STREET, NEW YORK CITY. H. J. HARDENBERGH, ARCHT. 207.

Attention is called to the fact that some 61,000 cu. ft. of terra-cotta are used on this building and the Astor Court Building, seen in the distance. This includes the work made for the interior, on the ground and first floors. The total weight was about 2,200 tons, which is equal to 600 truck loads of 7,333 lbs. each.

ARCHITECTURAL TERRA-COTTA EXECUTED BY

The New York Architectural Terra-Cotta Company,

38 PARK ROW, NEW YORK CITY.

PHILADELPHIA.

BOSTON.